Scientific Agriculture

La Revue Agronomique Canadienne

VOL. IV. OTTAWA, ONT., JULY, 1924. NO. 11

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Published Monthly by the Canadian Society of Technical Agriculturists.

Forms close on the 23rd day of each month; all copy for advertisements, and changes of advertisements, should be received ten days before the date of issue.

All correspondence should be addressed "Scientific Agriculture, P. O. Box 625, Ottawa, Ont."

Cheques, money orders, etc., must be made payable to the order of the Canadian Society of Technical Agriculturists (C.S.T.A.)

Advertising rates on application.

Subscription price $2.00 *yearly to Canada and the United States; other countries* $2.50.

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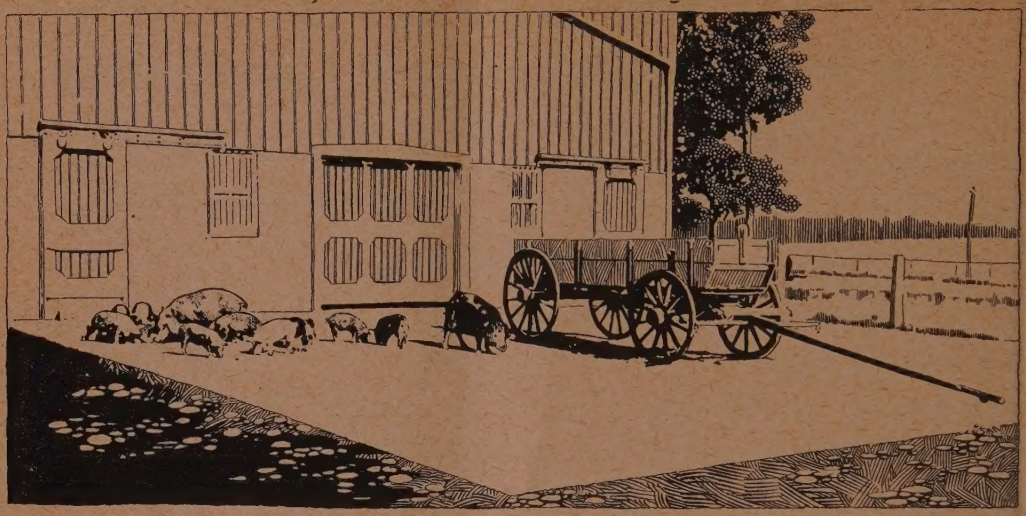

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THE GUELPH CONVENTION.

Those who were privileged to be at the Ontario Agricultural College during the week of June 9th will be able to look back upon a number of very enjoyable and profitable events. The Annual Convention of the C.S.T.A., with which we are naturally concerned chiefly, was only one of a number of important features which marked this week of celebrations in honour of the fiftieth anniversary of the O.A.C.

One cannot give any detailed account of these various features, and the columns of this issue will feature only the business meetings of the C.S.T.A., with which our members are chiefly interested. We desire, however, to extend our congratulations to all those who assisted in the arrangement of the Semi-Centennial celebrations, which made the Fourth Annual Convention of the C.S.T.A. so successful. The many social events, the beautifully solemn dedication of the new Memorial Hall, the parades of departmental floats and live stock, and many other features of the week, deserve more than passing mention, but we feel sure that many detailed reports are being published elsewhere and will reach our readers.

Over five hundred graduates and ex-students of the O.A.C. attended the Semi-Centennial. Six members of the original class of 1874 were present and every graduating class since 1888 was represented.

In the following pages will be found (1) the reports of standing committees on Research, Graduate Studies and Marketing Education, (2) The Presidential Address, (3) The report of the General Secretary, (4) the personnel of all committees for 1924-25, (5) resolutions passed, (6) Scholarships and Fellowships awarded, (7) much other information arising out of the business meetings. The report of the Committee on Educational Policies, will appear in an early issue.

ADVANCED LECTURES

The series of advanced lectures provided by the Dominion Department of Agriculture, occupied the mornings of June 12th and 13th. Four courses had been arranged—Economics, Horticulture, Animal Husbandry and Agronomy—and six lectures were given in each course. The attendance was excellent, and in order that those who were not able to be present may benefit from them, several will be published in later issues of *Scientific Agriculture*.

AMENDMENTS TO CONSTITUTION AND BY-LAWS

Article 3, Clause 2, of the Constitution was amended to read as follows:

"Associate members shall be those engaged primarily in agricultural research, administration, education, extension work, publicity or experimental problems, who were accepted as Associate members prior to June, 1924.

"An Associate member becomes a regular member on attaining any of the qualifications for regular membership."

This change, while retaining all our present Associate members, and extending to them full voting powers, prevents the enrolment of further members of this class. Provision is still made for the admittance of non-graduates as regular members, subject to the approval of the Membership Committee, and it is expected that Associate members, of whom there are thirty, will be gradually promoted to regular membership when their qualifications justify such promotion.

Clause (b) of Article 5 of the Constitution, providing for Provincial Executives, was abolished. This leaves the organization of the Society to (a) the Dominion Executive and (b) the Local Branch Executives.

Under By-law 3, Clause 3, referring to the organization of Local Branches, provision was made so that *under special circumstances a smaller number* (than 20) of members may organize a local. This provision was made to accommodate certain groups of members, in remote districts, who wish to organize their own branch but who have been prevented from doing so by the fact that a minimum of twenty members has been necessary.

RESOLUTIONS

The following resolutions were submitted by The Resolutions Committee (Dean E. A. Howes, Chairman, and Messrs. L. P. Roy, L. H. Newman, G. H. Hutton, A. Leitch), and approved by the Convention:

1. Resolved that the members of the Canadian Society of Technical Agriculturists in Convention assembled convey their deepest sympathies to Mrs. Reginald C. Treherne in the bereavement which she has sustained in the death of her husband, our fellow-member. (Passed by standing vote).

2. Whereas the numerous agricultural problems which press for solution can be effectively attacked only by fully trained specialists, and whereas opportunities for graduate study in Canada have been so limited that our technical agriculturists have not proceeded beyond the bachelor's degree or have gone to universities in the United States, and in many cases have thus been lost permanently to Canada, therefore it is highly important that all facilities for graduate training in Canada should be made available to our students, and to this end it is resolved by the C.S.T.A. in annual convention that the authorities of our universities and government departments be urged to accept the principle of university credit for extra-mural research, and to co-operate in arrangements whereby graduate credit may be obtained for work done wherever proper facilities are available and proper supervision is possible. The C.S.T.A. endorses the recommendation of the Committee on Graduate Work appointed by the Conference of Canadian Universities, that the direction and control of extra-mural work done for graduate purposes should rest with the university concerned, but suggest that its immediate supervision might when advisable be delegated to a competent officer of the co-operating department.

3. Resolved that the hearty thanks of the members and delegates assembled in the Fourth Annual Convention of the Canadian Society of Technical Agriculturists be tendered:

   (1) To the Dominion Department of Agriculture for defraying expenses in connection with the series of advanced lectures given during the Convention.

   (2) To the Ontario Agricultural College for providing such excellent accommodation and entertainment.

   (3) To the various Standing Committees and especially to the Chairmen of those committees for the valuable work done and the important contributions made in the interests of the Society.

GRADUATE SCHOLARSHIPS

The report of the Credentials Committee (Dr. R. Newton, chairman, and Messrs. B. L. Emslie, R. Harcourt, G. P. McRostie, L. P. Roy) follows:

The Committee was called upon to examine the credentials of candidates for three scholarships available only to members of the Society.

(1) A scholarship of $600 offered by the Chilean Nitrate Committee. For this scholarship your committee recommends Mr. W. A. DeLong, a graduate of the O.A.C. in 1920. Mr. DeLong has had experience as instructor in chemistry at the School of Agriculture, Raymond, Alta., and as assistant chemist at the College of Agriculture, Truro, Nova Scotia. During the past year he has taken graduate work at Macdonald College, qualifying for the degree of M.Sc. He proposes to continue graduate study at that institution, taking as a research problem the use of nitrates in the nutrition of apple trees.

(2) A scholarship of $500 offered by the Government of the Province of Quebec for a member belonging to that Province. For this scholarship your committee recommends Mr. S. J. Chagnon, a graduate of Iowa State College in 1921. Mr. Chagnon took the course leading to the degree of Bachelor of Arts at the University of Ottawa previous to entering upon his agricultural course at Ames. After a year's experience as county agent in Iowa, he returned to Canada as assistant to the Dominion Animal Husbandman. Mr. Chagnon is a native of Quebec, and retains ownership of a farm in that province; also his present official duties are to serve the interests of live stock production in that province. Since, however, his residence is now in Ottawa, the concurrence of the Minister of Agriculture for Quebec will have to be

secured for this appointment. Mr. Chagnon proposes to pursue studies in animal nutrition at Iowa State College or the University of Wisconsin.

(3) The C.S.T.A. scholarship of $600. If this convention decides to award a scholarship this year, your committee recommends Mr. W. H. Wright, a graduate of O.A.C. in 1912. From the time of graduation until 1920, Mr. Wright was on the staff of the Department of Botany, O.A.C., Guelph, with war service from November, 1915, to March, 1918. Since 1920, he has been with the Dominion Seed Branch, his present position being that of Supervising Analyst in the Toronto laboratory. He desires to follow special studies in seed testing in the Federal Seed Laboratory at Washington and at the University of Chicago.

Your committee desires to record its approval of the important suggestion in the General Secretary's report in regard to one possible method of obtaining C. S. T. A. scholarships, which might well be more extensively canvassed. Commercial firms might be approached with definite problems of an agricultural nature which were of economic significance to the industries they represented, and asked to donate scholarships in support of graduate students who would undertake the investigation of such problems. This method of financing investigations is in considerable use in the United States, and we have now an instance of it in the scholarship offered by the Chilean Nitrate Committee. It is perhaps not out of the way to suggest that our recommended candidate for the C.S.T.A. scholarship this year may have in mind some problem which would appeal to some Canadian seed house as worthy of support, if presented and explained to the management by some qualified persons delegated for the purpose by the society.

FELLOWSHIP

For professional distinction, the Society conferred a Fellowship upon Mr. William T. Macoun of Ottawa. Mr. Macoun, who was born at Belleville, Ont., in 1869, has occupied the position of Dominion Horticulturist since 1910, and has been on the staff of the Central Experimental Farm as Director's Assistant, Curator of Arboretum and Botanic Garden, and Horticulturist, since 1887. He has originated many varieties of fruits, notably the Melba and Lobo apples, the Cassandra, Portia, Lavinia, Hermia, Mariana strawberries, etc. He was awarded the Carter Medal of Honour in 1922.

The name of Mr. Macoun, proposed by the Dominion Executive for a Fellowship, was supported by Mr. E. S. Archibald, Director of the Dominion Experimental Farms, Prof. F. W. Brodrick of the Manitoba Agricultural College, Prof. T. G. Bunting of Macdonald College, and carried unanimously.

This is the fourth fellowship awarded by the Society, similar recognition having previously been given to Dr. C. E. Saunders, Dr. L. S. Klinck and Dr. J. W. Robertson.

HONORARY MEMBERSHIP

It was decided that an invitation to accept Honorary Membership in the Society should be extended to H.R.H. the Prince of Wales.

1925 CONVENTION

On the invitation of Dean E. A. Howes, it was unanimously decided to hold the 1925 Convention at the University of Alberta, Edmonton.

ATTENDANCE

One hundred and sixty C.S.T.A. members signed the register. This is the largest attendance at any Convention so far held.

GENERAL SECRETARY RE-APPOINTED

At a meeting of the Dominion Executive Committee held on June 12th, Fred. H. Grindley was re-appointed as General Secretary-Treasurer of the Society for the year ending May 31st, 1925.

On account of ill health, Mr. Grindley was authorized to take two months' leave of absence as soon as it could be arranged, and to secure such temporary assistance as would ensure the publication of the magazine during his absence, and the continuance of routine work. It was anticipated that this could be done before the end of July.

COMMITTEES

Following is the personnel of all committees for the year 1924-25:

RESEARCH—W. P. Thompson (chairman), P. A. Boving, J. A. Godbout, D. H. Jones, Arthur Kelsall, G. P. McRostie, A. V. Mitchener, H. M. Nagant, J. P. Sackville, J. F. Snell, J. M. Swaine.

GRADUATE STUDY—G. G. Moe (chairman), E. S. Archibald, G. R. Bisby, W. H. Brittain, M. Champlin, R. D. Colquette, B. T. Dickson, C. A. Fontaine, L. H. Newman, R. Newton.

AGRICULTURAL AND EDUCATIONAL POLICIES—L. S. Klinck (chairman), H. S. Arkell, W. J. Bell, M. Cumming, Charles Gagné, F. C. Harrison, E. A. Howes, C. H. Lee, Father Leopold, J. B. Reynolds, W. J. Rutherford.

MARKETING EDUCATION — A. Leitch (chairman), C. W. Baxter, J. F. Booth, W. A. Brown, F. M. Clement, A. A. MacMillan, Abel Raymond, J. A. Ruddick, S. E. Todd.

FINANCE—G. H. Cutler (chairman), A. E. McLaurin, Gustave Toupin.

MEMBERSHIP—G. C. Creelman (chairman), A. Kelsall, L. P. Roy.

AFFILIATIONS—W. H. Brittain (chairman), M. Champlin.

BALLOTS—A. E. McLaurin (chairman), E. S. Archibald, L. C. McOuat.

EXECUTIVE COUNCIL—H. Barton (chairman), G. C. Creelman, Father Leopold, L. H. Newman, A. E. McLaurin, A. Leitch, L. P. Roy, J. F. Snell.

ASSOCIATE EDITORS—H. S. Arkell, J. B. Spencer, J. M. Swaine.

EDITORIAL BOARD—(See elsewhere in this issue).

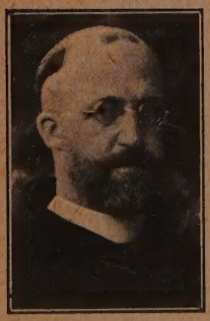
REPRESENTATIVE ON COUNCIL OF A.A.A.S.—Arthur Gibson.

AUDITORS—L. H. Newman and G. LeLacheur.

SCHOLARSHIPS—G. C. Creelman, L. H. Newman, R. Harcourt.

Officers of the C.S.T.A., 1924-25.

H. BARTON
Macdonald College, P.Q.
President



REV. FATHER LEOPOLD
La Trappe, P.Q.
Vice-President

G. C. CREELMAN
Beamsville, Ont.
Vice-President

L. H. NEWMAN
Ottawa, Ont.
Honorary Secretary

Presidential Address.*

H. BARTON

Macdonald College, P.Q.

The C.S.T.A. is now four years old. It has therefore reached an age at which it should begin to speak for itself. The time has come when we may expect it to be heard as well as seen. As we look upon it on this birthday celebration it should be gratifying to observe its physical development, the effect it has had on the members of the family, its record of behaviour and the ambitions it has for the future.

The Secretary's report shows no interruption in the growth and activity of the society, under prevailing conditions --a sufficient indication in itself that it must possess a good constitution, that it must have received sufficient nourishment and that it must have been well cared for.

The three vital organs of the C.S.T.A. may be said to be the central executive, the local branch and the official publication. The more one considers the conditions under which the society operates and the more one studies similar organizations that are successful, the more apparent does it become that those who established the C.S.T.A. endowed it with a sound constitution. The health the society may enjoy, the strength it can develop, and the service it shall perform must depend upon the vigour with which these vital organs function.

The central executive has more responsibility and more work than the members appreciate. There is more activity at the C.S.T.A. headquarters than it is possible to reveal to the members. Much of the work done thus far is not of a tangible nature, little of it is spectacular and owing to the scattered character of the membership this organ must work under some handicap in its relation to the individual member. There is even difficulty in incorporating the members of the executive in all the transactions of the society. However, as its more important activities develop and as increased facilities become available it will be possible to give fuller employment to the committee members and to establish more intimate connection with the membership at large.

The local branches were intended to perform a two-fold function—they are the connecting links between the central administration and the individual member and they are within themselves local organizations. It is to be expected that some will be more active than others and that there will be variation in what they undertake. If they are to serve their full purpose as locals this must be so. Some are so placed that there is no great need nor opportunity for an elaborate programme while others have pressing problems of interest to all local men in technical agriculture. During the past year I have had the pleasure of visiting about half of them. The meetings were an inspiration to me because it was the first time I was privileged to witness in different sections of the country, gatherings of men in my own profession met for purposes of good fellowship, mutual benefit and the promotion of a common interest.

The first object of the society is to unite all workers in Scientific and Technical Agriculture for combined effort in promoting the efficiency of the profession in the service of Agriculture. This object is justified in the belief that there is something to do on behalf of the profession and that there is common ground upon which the profession as a whole can meet. There have been some who questioned the suggestion of common ground and who felt that there was no place for such a society; that no society except the specialized type could hope to live, much less thrive. The history of the C.S.T.A. has revealed considerable productive territory open to it; throughout Canada there is still pioneering in the Agricultural profession. Moreover the society has discovered for many of us that there is something to gain by extending our own personal ground however intensive the specialized cultivation of it may be. Association and contact are the keys to such discovery. They are also the keys to attainment through united effort.

* Presented at the Fourth Annual Convention, C.S.T.A., June 11, 1924.

With the obstacle of distance to overcome, organized communication is imperative, hence the importance of our official publication. The provision and maintenance of a suitable publication is not a simple matter. While it is intended to convey society communications it is also expected to provide interesting and instructive information to the specialists and the general practitioner in both the profession and practice of Agriculture. Yet it must not encroach upon the field of the Agricultural press; it must be attractive in appearance and of a form and quality in keeping with the dignity of the society; it must be well edited and it must be paid for out of the funds of the society. Despite these exacting requirements *Scientific Agriculture* has had a satisfactory record. To use President Reynold's expression "the magazine has sought the middle of the road and has been reasonably successful in finding it." It is not too much to add that in the capacity of editor none but a "Sir Faithful" could have followed it.

To live and thrive the C.S.T.A. must be fed. Its requirements are loyal support, information and money. It was born at Ottawa during an enthusiastic Convention and it soon had four hundred charter members. To-day it is well on the way to doubling that membership. It has had many workers and few dissenters. There are those it would appear who have not been touched very closely but the value of membership in this organization cannot be measured fairly by the immediate, direct, or personal benefit. To the great majority this fact need no emphasizing.

Broadly speaking there are three types of society information. One is in the form of contributions to the magazine. There is a place for *Scientific Agriculture* in the distribution of material which technical agriculturists in general are glad to have and which otherwise they are not likely to receive. There is also what may be termed official information of particular interest to professional men and which logically should be carried in our publication. More important than either of these perhaps and often more difficult to secure is the type of information that has to do with problems with which the society is concerned. There are problems of vital interest to professional agriculture that must be carefully studied and reported upon before there can be any general understanding of them. In many cases until there is full and complete understanding of them, no solutions are likely to be forthcoming and when solutions do appear, widespread appreciation may be necessary to bring about their adoption. This involves hard work by committees and general publicity of their findings. A good start has been made, some important reports have been submitted but still more must be done to bring these to fruition and further work must be gotten under way.

The Society is not highly capitalised, neither is it operated entirely by voluntary effort. It has to pay for the publishing of the magazine, it has running expenses and it employs a paid secretary. These have been regarded as necessary features in its operating policy and experience seems to indicate the wisdom of those who inaugurated it. There are two chief sources of revenue, membership and advertising. Membership dues are sometimes in arrears and advertising is not soliciting space. Both conditions can be accounted for in the same way. Despite times of financial stress the society has been able to finance fairly satisfactorily. It has not had a crisis in the past year. More money could be consumed with great relish and unquestionably it would accelerate development. If some means could be found that would make the society more independent financially, enable it to reduce fees still further and yet give it working capital, sufficient to provide necessary assistance and facilities for the Secretary's office, expenses of committees, and something for special undertakings, more action would result and the society would become more firmly entrenched in the hearts of its members. Such a development is not beyond the bounds of possibility.

It is not necessary to say much about the care of the society. The record of its genial secretary as nursemaid, governess and guardian is well known and appreciated. It has now reached a period however when it must be given more liberties and where we may expect it to be more self-reliant. We must expect less of the Secretary and have more

to do with it ourselves. This should be realized by every member and especially by those on committees and those in charge of local branches. May I ask the delegates to convey this message to their respective locals.

You will agree I am sure that in my remarks in regard to the physical condition and welfare of the society there is reason for some pride and justification for every hope.

This brings me to the question of ourselves. What has the society done for us? Has it affected the members in any way? Perhaps each member might want to answer this for himself. No doubt family differences would be made known but a true perspective of the family as a whole will reveal some common good. Intercourse has been one of the products. Acquaintance and fellowship alone are well worth while. Our calling has been placed before the public and before ourselves as a profession. Professional pride has had some needed cultivation. Solidarity amongst the workers in technical agriculture has been felt, the spirit of cooperation has been stimulated and as is usually the case in large families, discipline has not been escaped. The sum total is that individually we have experienced some elevation which will widen our outlook and collectively we have gained a consciousness that will make us more assertive of the cause for which we labor. It is high time that the profession of Agriculture occupied its rightful place in Canada. We have been too content to worship at the feet of other professions and beg for recognition. Some of us have been too modest to believe that we had a real profession and others of us have failed to see distinction in Agriculture unless it was tagged with something that passed as being of a higher standard. No training is too advanced for Agriculture, no experience is too broad, no subject is bigger or deeper or more fundamental and with all due modesty but nevertheless complete confidence, for there is plenty of evidence, may I say no men are more capable than those to be found in our own ranks. We are on the way to an appreciation of these things, beginning to sail our own boat and the C.S.T.A. is our propeller.

For the most part the type of work which the society must undertake does not lend itself to immediate result. Since its organization it has been striving to bring about a better order of things in the difficult field of Agricultural education. No one expects or desires radical and rapid changes but everyone would like to feel that the most intelligent collective effort possible is being brought to bear upon influential features that seem to call for careful consideration at this time. Special attention has been given to marketing education, post graduate studies, research and policy in general. A great deal of spade work has been done, important issues have been clarified, guiding principles have been indicated and further developments are pending. The magazine has been conducted successfully as a business venture. Apart from financial returns its advertising policy has done something to develop contact between business interests that have to do with Agriculture and the profession. The commercial field for technical agriculturists is one that will bear more exploring. Not only is there possibility for employment, there is also opportunity for service on behalf of both business and practical agriculture.

Closer relationship between agricultural workers is forcing clearer definition of activities, reducing overlapping and promoting cooperation.

During the past year for the first time professional Agriculture in Canada was afforded an opportunity to use its combined influence and to express its views officially in regard to a question of national importance. It did not succeed in having the Federal Grant continued but it had the advantage of an opportunity to impress Dominion and Provincial representatives, as well as the general public with the vital character of agricultural education and the imperative need for its continued development.

The economic condition of the members has not been overlooked. We are all conscious of the fact that remuneration paid to the profession of Agriculture in Canada has been of lower range than that received by many others. Owing to prevailing circumstances in the past it has not seemed advisable to press the issue of remuneration. Every worth while contribution that the society can make for the profession is a contribution to-

ward the betterment of its economic status. Professional service of economic value may be rendered in various forms. The book club, the bureau of records, "Who's Who", and paper reprints may be cited as illustrations. When a situation develops, however, where the standards the society is endeavoring to establish cannot be maintained because of inadequate salaries and where the profession is suffering because of discrimination that seems unreasonable, more definite action is called for. In using its influence to remedy such conditions as it is now doing in one instance, the society is merely meeting obligation assumed by academic organizations.

As we go forward we may expect the gradual culmination of activities that have to do with long time projects. We now have an accumulation of data and an established position that should enable us to do some concrete work. Agricultural education affords so much latitude that unless effort is properly focused there is danger of dissipating energy. Objectives therefore must be clearly distinguished.

The aim for high standards in the profession and new scientific information cannot be questioned but helpful service to the farmer must remain a fundamental requirement of any position we may hope to occupy. Conditions in Agriculture are challenging our profession as it has never been challenged before. It is the function and responsibility of the C.S.T.A. to point the way for any necessary readjustment that will insure future progress of the most telling kind. It is possible that we have had too much individualism in the past. If a little adversity makes collective consideration and combined effort more welcome and imperative it may provide the needed reinforcement for Agricultural education.

The O.A.C. in its fiftieth anniversary has been paid many splendid tributes but none finer than that "it served the farmer." Our Society stands in a somewhat different relationship but it can have no greater ambition for the years to come than to justify a like tribute that it served Agriculture.

Reginald Charles Treherne

The death of Mr. Reginald Charles Treherne at Ottawa, on Saturday, June 7th, came as a shock to all those who knew him. A man of many friends in many parts of Canada, a man of buoyant spirit, and a man of unquestioned ability, his loss is one which can scarcely be realized. His illness was of extremely short duration and death was due to acute peritonitis.

Mr. Treherne was born at Aldershot, England, on March 24, 1886 and was therefore in his thirty-ninth year. He graduated from the Ontario Agricultural College in 1909 and was in the service of the Dominion Department of Agriculture from that time until his death, attached to the staff of the Entomological Branch. He acted as Field Officer in New Brunswick and Ontario from 1909 to 1911 and in British Columbia from 1911 to 1915. From 1915 until 1922 he was Entomologist-in-charge for British Columbia, acting Provincial Entomologist and, during 1921 and 1922, Lecturer in Entomology at the University of British Columbia. In 1922 he was appointed Chief of the Division of Field Crop and Garden Insects, with headquarters at Ottawa, which position he occupied at the time of his death.

He was a member of the American Association of Economic Entomologists, the Entomological Society of America, the Ecological Society of America, the Association of Economic Biologists (England), the Entomological Society of England. He was a charter member of the C.S.T.A. and did much to stimulate and promote the development of the Society in British Columbia.

He is survived by his wife and one son, aged one and a half years. The sympathies of his fellow members in the C. S. T. A. were expressed by a standing vote at the recent annual Convention of the Society and have been conveyed to Mrs. Treherne.

Report of the General Secretary-Treasurer.*

FRED. H. GRINDLEY

Once a year the General Secretary is afforded the privilege of reporting the preceding year's activities to the duly appointed delegates and to such other members as may be present at the Annual Convention. As the present General Secretary has presented all such reports since the Society was organized, he has considered it advisable to avoid too much repetition by placing less emphasis in his report this year on many laments, complaints and criticisms which have been repeated by him for the past three years. These referred to the need for greater membership interest, of less desire for personal benefit from membership, of more adequate and satisfactory headquarters, of more support to the official organ, and so on. The conditions which prompted such statements in previous reports have not been removed, but it is probable that much of the cause for the condition lies in the fact that comparatively few members are sufficiently familiar with the Society's inward activities and difficulties to take that interest which the General Secretary might expect. A solution of the difficulty lies in the development of closer contact, through the local branches, between the office of the General Secretary and the individual members. It may be a slow process but it is bound to be an effective one.

During the course of this report the most outstanding features of our operations during the past year will be briefly covered and it is desired that out of the discussion which follows, some suggestions may be made which can be put into effect to advantage in the future. At previous conventions it has been customary for the report of the General Secretary to be adopted with little or no discussion and consequently the Society's affairs have been conducted for four years without very much counsel from the membership body or their representatives at Conventions. That is a mistake and one which is being rectified this year by providing a discussion period.

Membership

During the past twelve months it has been necessary to remove the names of 38 members, either on account of resignation or for non-payment of fees. One member has been lost through death—Albert Edward Matthews died at Windsor, Ontario, on September 1st, 1923. The membership has been increased by the addition of 100 regular members and 11 associate members. It is significant that six of these regular members were men who had resigned during the first two years of our development and joined for a second time. The membership of the Society, therefore, increased during the year from 662 on June 1st, 1923 to 734 on June 1st, 1924. The distribution of this membership by locals is as follows:—

	June 1924	June 1923	June 1922
Alberta	54	59	35
British Columbia	74	63	71
Manitoba	47	52	48
New Brunswick	34	27	30
Nova Scotia	26	23	21
Eastern Ontario	101	95	80
Western Ontario	104	96	68
Prince Edward Island	14	12	12
Macdonald	57	56	49
Quebec	67	50	56
Montreal	48	42	42
North Saskatchewan	36	28	20
South Saskatchewan	47	38	32
U.S.A. and Foreign	25	21	19
Total	734	662	583

Text Book Club

There has been a gratifying development in the Text Book Club. During the year 1922-23 sales of books to members amounted to $516.00, whereas in the year just closed the sales reached a total of almost $1,000.00. At the present time there is practically no publishing house in Canada, the United

* Presented at the Fourth Annual Convention, C.S.T.A., June 11, 1924.

States or in England, handling agricultural texts, which does not give to the Society the benefit of a trade discount, and by extending this discount to our members we are giving a service of which increasing numbers appear to be taking advantage.

Who's Who

During the past winter the information originally collected for the Bureau of Records was brought together and published as a "Who's Who." The General Secretary had recommended at the last Convention that this be done, and as his report was adopted it might be assumed that such a step was authorized. It was deemed advisable, however, that the matter be considered by the Executive Council and referred to the local branches. With comparatively few exceptions the publication of the "Who's Who" met with approval. It was printed in April, 1924, and mailed to all members who had expressed a desire to receive it. The expense involved does not appear in the financial statement, because all revenue is being turned over to the printers as it comes in. Unfortunately payments have been extremely slow and further circularizing will be necessary before promised payments can be collected. The Society ought to break even on the publication of the volume.

The Federal Grant

Reference should be made to the part played by the Society in the campaign for a renewal of the Federal Grant for Agricultural Education. Following a meeting of the Executive Council in September, 1923, letters were sent to all Deputy Ministers of Agriculture and to the Ministers of Education in Alberta, British Columbia and Saskatchewan, enquiring as to what action, if any, was being taken in the matter. The danger of a discontinuance of the grant was also pointed out in a lengthy letter to the local secretaries in provinces outside of Ontario and Quebec, with the recommendation that provincial campaigns be organized and that special efforts be made to bring arguments to the attention of the members of the Federal Cabinet. The President and General Secretary kept in close touch with the situation as it developed at Ottawa.

When the Cabinet arranged to hear provincial representatives on January 3rd last, the President and General Secretary were invited. The statement made by Professor Barton was published in the February issue of *Scientific Agriculture*.

In some provinces, notably Nova Scotia, the local branches organized energetic campaigns, and petitions, resolutions, etc., reached Ottawa in large numbers.

All our time and effort were without avail, and provincial Ministers of Agriculture were officially notified early in February that the Grant was being discontinued in an effort to balance the budget. The part played by the Society, however, did much to bring the organization to the attention of the Government of Canada, and for the first time in the history of this country, technical agriculturists were officially represented in a delegation before the Prime Minister and the members of his Cabinet.

Scientific Agriculture

The official organ of the Society has been published regularly and promptly each month. There has been little change in the editorial policy, and there is still a great deal of criticism from one group of members who consider that the magazine is too technical in nature, and another group of those who think it is too popular. An effort has been made to steer between these two extremes, but apparently we are reaching a point where more attention will have to be given to this part of the Society's work.

There has been a slight decrease in the advertising revenue. Much of the cause for this can be traced to the long continued industrial depression and its effect upon agricultural manufacturers. Added to this is the fact that the General Secretary has found it impossible to spend as much time as formerly on personal visits to manufacturers and advertising agencies, and the greater part of his campaign work has had to be done by correspondence. This is not satisfactory and the appointment either of an advertising committee or of one or more commission agents to assist in taking care of our advertising interests should be considered. I think the advertising situation is now at its worst, or will be this summer, and that many firms

which are keenly interested in the Society and its work, will give to our magazine a share of their advertising appropriation just as soon as industrial conditions will permit.

The difficulty of securing suitable articles for publication has been as serious as ever. On one or two occasions during the year, when emergency notices had to be sent out, the response was quite gratifying, and the articles appearing in the magazine seem to be satisfactory.

Scientific Agriculture has now become known favourably throughout the world, and abstracts of many of our articles can be found in current issues of the Experiment Station Record, the Review of Applied Entomology, Chemical Abstracts, the Review of Applied Mycology, and similar publications.

Local Branches

Time does not permit any detailed report of the activities of local branches, but a brief statement can be made. The type and the frequency of branch meetings vary considerably. In the Maritime Provinces, a Field Day during the summer months and a joint meeting at the Amherst Winter Fair are apparently considered sufficient. The Macdonald and British Columbia locals concentrate their efforts upon two meetings annually, one in the fall and one in the spring. The British Columbia local has also organized several creditable enterprises, including a membership booth at the New Westminster Exhibition and numerous educational and social outings. The North Saskatchewan and Montreal locals have held monthly meetings throughout the winter, which have been quite successful. The Western Ontario local held a joint banquet with the O.A.C. Alumni in Toronto last November, during the week of the Royal Winter Fair. Nearly two hundred were present, including C.S.T.A. members from every province and it was probably the largest and most representative gathering of professional agriculturists that has ever been organized. Meetings of the Eastern Ontario local have not been as frequent as in former years, but two or three meetings were held during the winter and a motor trip to the Kemptville Agricultural School last summer. The South Saskatchewan branch has a tendency to feature social activities and has found this type of meeting, with the addition of an annual business meeting, quite satisfactory. Meetings of the Alberta, Manitoba and Quebec locals have not been frequent but reports from their secretaries are entirely satisfactory.

It is the intention of the General Secretary to develop a Bureau of Information, in co-operation with the Departments of Agriculture and the Agricultural Colleges, so that local secretaries may take advantage of the visit, to their headquarters, of prominent agriculturists. Such a service appears to be needed and the C.S.T.A. offers an ideal medium through which to develop it.

Travelling

Returning from the Saskatoon Convention, the General Secretary attended a meeting of the Manitoba Local at Winnipeg. In August, 1923, he visited the three local branches in the Maritime Provinces, addressing meetings at Fredericton, Charlottetown and Kentville. As this was his first visit since these locals were organized in 1920, it was possible to give the members an outline of the parent Society's development, some of its major difficulties, and other information with which they were not familiar. The locals at Montreal, Macdonald, Ottawa and Western Ontario were visited on at least one occasion during the year, but with the exception of the Maritime trip and the Saskatoon Convention, the General Secretary did not travel outside of Ontario and Quebec during the year.

Graduate Scholarships

The C.S.T.A. Scholarship of $600.00 awarded at the last Convention to W. F. Hanna, was paid in six monthly instalments of $100.00 each, while Mr. Hanna was taking his studies at the University of Manitoba. Whether this Scholarship will be awarded this year will be decided by the Scholarship Committee. This Committee will also select a candidate for the Chilean Nitrate Committee's Scholarship of $600.00 for research work in orchard fertility, tenable at any Canadian University, and for the Quebec Department of Agriculture Scholarship of $500.00, open to members resident in Quebec and tenable at any recognized University. It will be noted

that this year there is a certainty of two and a possibility of three Scholarships being awarded as compared with one last year.

The members of the Board of Trustees have not found it possible to raise money for the Scholarship Fund. The only private donation was one of $50.00 from President Klinck, himself a member of the Board. It would appear that if the C.S.T.A. Graduate Scholarship Fund is to increase in usefulness, it will be necessary to approach corporations with a definite research problem in view, and one in the solution of which the firm or corporation might be interested. Support might be obtained in this way with greater ease than by soliciting assistance for a Fund before any definite statement can be made as to the work that is going to be done with the money.

Standing Committees

Reports of all Standing Committees are being presented at this Convention.

Appointment of French Secretary

At the request of the French-speaking members, the Dominion Executive Committee appointed Mr. George Bouchard as a part-time French Secretary and Editor. A salary of $50.00 a month was attached to the position, with the understanding that the revenue of the Society must be increased by that amount as the result of his efforts. Mr. Bouchard was unable to undertake his duties until January, 1924, and the financial statement shows that $150.00 was paid to him prior to May 31st. His work produced a net revenue of approximately that amount. Whether this arrangement will be continued will depend upon the wishes of the French members and the decision of the Dominion Executive.

Summary of Questionnaire

In order to furnish members of the Society with a brief summary of our activities, a leaflet was printed and distributed early in 1924. Advantage was taken of this leaflet, through a questionnaire attached to it, to obtain from the members an expression of opinion upon some of the difficulties and considerations of major importance with which the Society was confronted. A sufficient number of members returned this questionnaire to permit the formation of a summarized report.

Eighty-one percent of those who sent in the questionnaire considered that the present membership fee of $6.00 per year was satisfactory and nineteen percent considered that it was too high.

Forty-four percent were in a position to contribute at least one article per year to the magazine and the remainder either gave no answer to this question or stated that they could not furnish articles.

In answer to the question as to what new lines of work might be undertaken by the Society, the majority were of the opinion that its activities were already sufficiently extensive. A number of suggestions were made, however, among which the following might be mentioned: (1) The establishment of an employment bureau; (2) The building up of an agricultural reference library; (3) Provision for student members; (4) The coordination of experimental work; (5) A world survey of agricultural education; (6) A press service of agricultural science news; (7) More consideration of the business of farming and marketing; (8) More consideration of the problems of technical agriculturists, and especially of the development of wider fields of employment; (9) The encouragement of affiliations with other scientific organizations.

Among the suggestions for improvement in the official organ of the Society the following perhaps deserve consideration; (1) The publication of reviews of current agricultural articles, bulletins, texts, etc. (2) More news of the activities of members and of local branches; (3) The introduction of a section of letters to the Editor; (4) The appointment of one or more advertising salesmen; (5) The publication of abstracts in French of English articles and vice versa; (6) Make the necessary arrangements so that the magazine may become the organ of Federal and Provincial Departments of Agriculture; (7) Publish shorter articles with a wider range of subjects.

The members were asked whether it would be advisable to consider the extension of trade discount to commodities other than agricultural text books. Fifty percent of the replies were to the effect that this should not

be undertaken. Of the remaining fifty percent, the following commodities were suggested: Agricultural magazines, all kinds of books, printed material such as Christmas cards, laboratory equipment, cameras and photographic supplies, office supplies.

Eighty-four percent of those who replied considered that the local branches were holding meetings of the right type and at sufficiently frequent intervals.

One hundred percent considered that the Society had made satisfactory progress since its organization in 1920.

Financial Situation

A study of the financial report reveals several interesting features.* Of foremost importance it is to be noted that a cash balance of $261.40 has been turned into a cash balance of $668.49 and that an actual credit balance of $1,492.19 is transposed into an estimated credit balance of $1,711.69. This has been done during the past year when we awarded a $600.00 Scholarship, paid $150.00 to a French Secretary and invested $115.00 in a typewriter. There has been an increase of $255.00 in the revenue from fees, as compared with the previous year. Printing charges on the magazine have been reduced by $230.84, on miscellaneous printing by $438.01 and on cuts for the magazine by $144.08. The loss of $516.64 in our advertising revenue prevented any substantial increase in our credit balance as compared with last year so that during the twelve months just closed the surplus of revenue over expenses is only slightly over $200.00 as compared with nearly $900.00 the previous year.

The incoming Dominion Executive Committee will find it necessary to consider a number of matters affecting the finances of the Society and the membership body should be informed as to the nature of these considerations. There is still sufficient criticism of the $6.00 fee to cause alarm and quite a number of members are of the opinion that it should be reduced to $5.00. It must be remembered however that with our present membership a decrease of $1.00 in the renewal fee means a decrease of nearly $750.00 in the annual revenue of the Society. There is no assurance that the advertising revenue can be maintained; in fact it is almost certain that for the year now commencing it will show a further decrease. There appears to be no way of operating the Society with a lower expenditure and some new means of obtaining the additional revenue required by the Society in its further development will have to be considered.

*Copies of the Financial Statement for the year ending May 31, 1924, may be obtained on application to the General Secretary.

The Fourth Annual Convention

Plans for the Fourth Annual Convention were started early in the calendar year and the General Secretary has kept in close touch with the Secretary of the Semi-Centennial Committee in order that our business meetings and the series of advanced lectures might constitute a part of the general programme.

Members of the C.S.T.A., and many others, are indebted to the Dominion Department of Agriculture for a generous extension in the courses of advanced lectures. This year nineteen lecturers have accepted invitations and four concurrent series of lectures have been arranged — Agronomy, Animal Husbandry, Economics and Horticulture.

The following official delegates have been appointed by the various local branches:

Alberta—G. H. Cutler, E. A. Howes, W. H. Fairfield, G. M. Stewart.

British Columbia—L. S. Klinck, R. G. Newton, W. H. Robertson, C. Tice.

Manitoba—T. J. Harrison, H. B. Smith.

New Brunswick—C. F. Bailey, G. R. Wilson.

Nova Scotia—A. Kelsall.

Eastern Ontario—E. S. Archibald, H. G. Crawford, F. L. Drayton, W. T. Macoun, L. H. Newman.

Western Ontario—B. L. Emslie, A. Leitch, A. W. Mason, E. F. Palmer, W. J. Squirrell.

Prince Edward Island—J. A. Clark.

Quebec—L. P. Roy, J. A. Godbout, A. Pepin.

Montreal—Gustave Toupin, J. N. Ponton.

Macdonald—T. G. Bunting, L. C. Raymond, C. E. Petch.

North Saskatchewan—L. E. Kirk, W. P. Fraser.

South Saskatchewan—P. H. Ferguson, C. M. Learmonth.

Ballots for the annual election were mailed to all members on April 10th, and opened at Ottawa on May 1st. The following official results were announced in the May issue of *Scientific Agriculture* and through the Associated Press:

President—H. Barton.

Vice-Presidents— G. C. Creelman, Rev. Father Leopold.

Hon. Secretary—L. H. Newman.

The Society was represented at the Annual Meeting of the American Association for the Advancement of Science, with which we are affiliated, by Professor J. E. Howitt.

In conclusion, I should like to point out that the greatest difficulty the Society has to face, and one which has always existed, is the lack of solidarity of membership interest. There is too much individualism and too little interest and pride in the profession as a whole. Many of the objects of the Society can never be accomplished until practically every eligible member has joined.

In four years the C.S.T.A. has made a tremendous development in the face of difficulties and obstacles which very few members appreciate. To have enrolled nearly seven hundred and fifty members, established thirteen branches, secured ownership of its own magazine and made it self supporting, established scholarships for research, developed the wholesale handling of text books fo its members, to say nothing of the importa work being done through its Committees an at its Conventions, is no mean accomplish ment. It has made itself known in ever country in the world and has done more t bring fellow workers together and to foste a spirit of co-operation in effort, than coul have been done in any other way. These a complishments are not appreciated by th members as a whole.

If every member would sink his indivi uality, and look upon his membership in th Society as his contribution to his professio the organization would have few difficulties face. The C.S.T.A. has passed through th danger period and is now at a point whe it can undertake many new lines of effor To do this, and to carry on the work that ha already been created, requires time, labor an money. None of these is available unde present conditions but we may hope that the will all be made available in some way b fore very long.

Book Reviews.

FARM CREDITS IN THE UNITED STATES AND CANADA.

JAMES B. MORMAN

(*Macmillan Company of Canada, Toronto*)

A much talked-of subject in Canada—our danger is to continue to talk and do little else. And what a deal of nonsense is spoken on this topic!

Canada's fundamental industry is, and ought to be, agriculture. Unlike transportation and banking, unlike many of our manufacturing industries, it is carried on in comparatively small units, with no organization so far as *production* is concerned. Government and Public express much concern when banks seem to be in difficulties, while the financing of transportation seems to be Canada's chief dissipation.

Let us forget the individual farmer for a moment. The prime duty of a country is to provide for its food supply—as fundamental as its duty to maintain its national existence. Canada's supply or its possibility lies within its own borders. The getting of that supply creates here an industry and develops a whole "way of life", a form of society, a body of folk that forms a service of suppl for city and town population, that eve creates that population anew.

Here then is an industry forming a bas for a form of society that in health an wealth, in physical, mental and moral d velopment, in enlightened conservatism shoul be our chief national asset.

Such an industry needs financing as muc as railways and manufacturing — we hav "bonussed" both the latter for nearly fift years—and they call us still unfed.

Morman's book is the best discussion the situation in the United States and Ca ada we have read—sane, balanced, fair—i lustrated by a wide and accurate knowledg of conditions, remedies and nostrums Europe. The present writer has had oppo tunity to check his statements with respect Germany—they are fair, accurate, extensiv

We purpose to use this book next term our work with Fourth Year Students in Ma donald College, Quebec. Together with D Tory's report, this book should give to o students just the information, point of vie sympathetic insight so needed in future lea ers in Technical Agriculture.—H.D.B.

Report of the Committee on Graduate Studies.*

G. G. MOE

University of British Columbia, Chairman.

You will recall that the report of the Committee on Graduate Studies as presented a year ago was primarily a survey of the opportunities for advanced courses and degrees open to agricultural graduates in Canada.

This year the report reflects the efforts of the Committee to give concrete expression to previous recommendations as well as to prepare for your consideration recommendations on other questions pertaining to graduate work in the Dominion.

It has long been recognized that if graduate work in Canada is to be of the greatest service to the profession and to agriculture as a whole, the facilities for this work must be of such a nature that they provide opportunity for advanced study not only for the young graduate, but what is of even greater present importance, for the proven graduate of some years' standing. Each year in increasing numbers, men in our Dominion and Provincial Departments desire to equip themselves still further for their present duties by graduate study and find it almost impossible to disassociate themselves from their positions, due to their official or family responsibilities or to inhibiting regulations.

In order that the graduate needs of this large body of men may be met, yet at the same time the highest standard of graduate work be performed, your committee has realized that any plan submitted for the advancement of graduate work in Canada must have two qualifications. First, the regulations must be sufficiently elastic that full advantage may be taken of the opportunities for study and research now available in our Universities and Dominion and Provincial Departments. Second, the regulations must be sufficiently rigid that the type of work performed and the standard of the degree conferred, be fully equal to that of the leading institutions of the United States and Great Britain.

A year or two ago, it was scarcely possible to contemplate the placing of graduate work in agriculture on such a broad footing. Since that time a report on the general question of graduate work in Canada as pertaining to all lines of advanced study was presented to the Conference of Canadian Universities by a special committee. This special committee under the chairmanship of Dean Adams of McGill University had been studying this problem for several years. Their report was approved by the above conference and a committee appointed to work out details. Coming as it did from such an important and authoritative body of University opinion, it was felt that this report should be available to all members of this Society, consequently, it was published in the May issue of *Scientific Agriculture*. As most of you have doubtless read this report for purposes of comment, it is unnecessary to go into details other than to quote its main recommendations:

A. That the requirements in the various Universities be standardized to the extent that it may be possible for a student to pass from one University to another with full credit for the work already completed.

B. That co-operation with such departments at Ottawa as have graduate materials available be established on the basis that the direction and control of the student's work for graduate purposes rest with the University to which the student is attached or a co-operating University.

C. That the University at which the student is a candidate for the Ph.D. degree appoint external examiners to act with examiners appointed from within the University as an examining board for that particular candidate.

From the foregoing it is at once apparent that if effect can be given to the above recommendations, many of the difficulties now attending the taking of graduate work would be overcome. Geographical difficulties would be surmounted, the facilities for research of the Dominion Department of Agriculture would be available and the outstanding Departments of any University would be open to any qualified student who wished to place

* Presented at the Fourth Annual Convention, C.S.T.A., June 10, 1924.

himself under its direction, or to borrow the words of Dean Adams "the class room and laboratory of every distinguished professor or teacher of every university in Canada would be open and readily accessible to any advanced student from any other university in Canada."

Credit for Extra-Mural Research and Authorized Transference of Work

In the report presented by this Committee last year there was embodied an important suggestion to the effect that some arrangement should be made whereby junior officials of federal or provincial departments, would be given a certain amount of credit, not to exceed one third, towards their graduate work for investigation performed under suitable supervision.

A somewhat similar suggestion, that applies to unattached students, was put forward by Dr. Harrison to the Conference of Canadian Universities. His proposal was that various departments of the Dominion Government might be utilized for graduate work if the Dominion Department of Agriculture would employ post graduate students, duly recommended and endorsed by College authorities, to carry on some definite work under proper supervision during the summer months and gave the privilege provided proper acknowledgements were made to use their results for their thesis.

As regards the point "*Transference of Work*", a member of the Committee submitted the following proposal: "The heads of the departments of agriculture Federal and Provincial should be approached with a view of obtaining from them a definite statement as to whether under all proper safeguards they are willing to permit deserving junior members of their staff the privilege of transferring their work for a period not exceeding one academic year to some recognized institution of learning, when it can be shown that such work can be performed there to better advantage, each case to be decided by the department on its merits".

The first suggestion, namely "that credit on graduate work should be given Dominion and Provincial employees for supervised investigation" was approved by this Society at its last meeting. The suggestion of Dr. Harrison was approved by the Conference of Canadian Universities. The Committee felt however that a more complete expression of opinion should be obtained on these questions as well as on the proposal for Transference of Work to some institution of learning; consequently endeavours have been made to learn from University, Dominion and Provincial authorities their views on these proposals.

As these questions involve consideration of policies on the part of the Colleges and Universities and the Dominion and Provincial Departments of Agriculture, it has not been possible to complete this phase of the report. It was felt however that the question of extra-mural credit for research should be given more definite expression, consequently a resolution has been prepared and will be submitted to you through the Resolutions Committee. If this resolution meets with your approval the committee recommends that copies be forwarded to heads of Federal and Provincial departments, deans of graduate schools and other specially interested parties.

Federal and State Aid in Graduate Training

In addition to the information sought by means of the inquiry just referred to, it seemed desirable that full information should be obtained from the various agricultural departments of the United States, as to the arrangements whereby men employed in the Federal and State services were enabled to obtain advanced training.

Through the courtesy of Mr. Hopkins, the Dominion Field Husbandman, whose assistance and cooperation is most gratefully acknowledged, a detailed statement of the arrangements has been made available to the Committee. Owing to its tabular form this statement has been appended to the report.*

Activity Among Canadian Graduates

A proposed arrangement that marks a new development in graduate work should be recorded. A group of men in the Dominion Service who wish to pursue advanced studies are endeavoring to make some arrangement whereby a course of extra-mural lectures in certain subjects will be given in Ottawa biweekly by a lecturer of a University. It is proposed that the instruction given would be credited toward a master's degree, which

*See Pages 346 and 347.

would be conferred on successful candidates by the institution to which the instructor was attached when they had fulfilled the usual requirements for that degree.

Other questions relative to graduate work have been considered by your committee.

Summer Courses in Graduate Work

In the report on graduate study presented to this society last year, the point was stressed that if graduate work is given by any institution the instructors should not be overburdened with undergraduate work, otherwise the standard of instruction is lowered. Recognizing that our college departments are not overstaffed and that graduate work now given is an extra duty assumed by the instructors, the question was asked of the committee, if in their opinion the adoption of summer courses would offer a solution of this difficulty. The opinion of the committee is that the adoption of summer courses is undesirable as the instructor should be left free to devote his time to research, to other duties and to needed relaxation.

Interval Between the Undergraduate and Graduate Courses:

On this question the committee merely wishes to record its opinion that each case should be considered separately and depends upon the maturity of the individual student, with regard not only to his age, but also to training and experience in relation to the work which he is planning to do.

Fundamental Problems in Degree Courses:

It was considered advisable that certain questions of fundamental importance in graduate study should be placed before the convention for discussion. In research work the need of the investigator for more fundamental and specialized training in the basic sciences is increasingly emphasized. So clearly has this need been demonstrated that some of our leading research men have taken or are now taking their major work in the pure sciences. The question at once arises, can greater use be made of the natural science courses of our Universities in the furtherance of graduate work in Canada? Furthermore, following the development of the need for intensive fundamental work in the sciences for the research man, there has likewise developed a tendency to distinguish somewhat sharply between the selection of courses for those who propose to engage in research and those who wish to engage in teaching or extension work. This last point was developed by Dr. Harrison in the first report on graduate study submitted to the Society. On points such as the above, the Committee considers it inadvisable to make recommendations until such time as a careful study has been made of present graduate courses both in the States and Canada and opinions secured from our leaders in agricultural education and research. It was not considered advisable to issue a questionnaire on these points if representative opinions could be obtained in Convention. Consequently, the committee earnestly desires comprehensive debate on the following points:

1. The basic work of the Doctorate Course.
2. The possibility of greater utilization of the natural science courses of our Universities.
3. Diverse courses for those who wish to engage in teaching or extension work.

Liberal Culture Degree

A member of the committee has made the suggestion that there be two kinds of master's degrees recognized, one which might be called the Liberal Culture degree, permitting a man to spend an extra year in advanced reading and more liberal training in the various agricultural subjects in which he has become especially interested. The member making this proposal states that he thinks such a course would be of more value to men who expect to teach in secondary schools, or to do district agent work and general agricultural promotion work, than the specific course requiring the preparation of an original thesis as the main item. In placing this suggestion before the Convention it is not intended that it be treated as a recommendation from the committee, but rather as a proposal or a new idea on which full discussion is desirable.

In presenting this report the committee makes no apology for leaving many problems and unanswered questions to its successors. If sound advance is to be effected in the establishment of agricultural post graduate work in Canada it is necessary that any recommendations pertaining thereto should be

REPLIES TO QUESTIONS INDICATED IN APPENDIX.

STATE	1 What is length of holiday period?	2 Are holidays cumulative?	3 Is Sabbatical leave provided?	4 Is difference made between clerical and scientific staff regarding holidays?	5 May staff take courses while on regular work?	6 Is policy rigid regarding leave?	7 What is your opinion regarding providing leave for graduate study?
Alabama	3½ weeks	No	No	No	Yes	No	Very desirable. Sorry nothing done.
Arizona*	4 weeks	No	Yes 3/5ths pay	No	Yes	No	Sabbatical leave most satisfactory.
Arkansas	4 "	No	No	Yes	Yes	No	Favours plan similar to Sabbatical leave.
Californi*	4 "	No	Yes 2/3rds pay	Yes	Yes, but part	No	Likes present system.
Carolina N.	4 "	Yes	No	No	Yes	No	Thinks some plan should be worked out.
Carolina S.	4 "	No	No	Yes	Yes	No	Thinks Sabbatical leave most satisfactory.
Colorado	12 "	No	No	Yes	Yes	No	Favours regulations in a large institution.
Connecticut*	4 "	No	No see 7	Yes	Yes	No	Favours individual plan practically equivalent to Sabbatical leave.
Dakota North							
Dakota South*	4 "	Yes	Yes	Yes	Yes	No	Favours Sabbatical leave on full pay.
Delaware	4 "	No	No	No	Yes	No	Favours Sabbatical leave.
Florida							
Georgia	4 "	No	No	Yes		No	Favours part pay for few months, no pay for a year or more off.
Idaho							
Illinois*	4 "	No	Yes ½ pay	No	Yes	Yes	Likes present system.
Indiana*	10 "	No	Yes ½ pay	Yes	Yes	No	
Iowa*			See No. 7		Yes		Institution provides plan similar to Sabbatical leave on half pay.
Kansas	4 "	No	No	No	Yes	No	Favours Sabbatical leave on at least half pay.
Kentucky*	4 "	No	Yes ½ pay	No	Yes	No	Likes present system.
Louisiana	8 "	No		No	No	No	Some plan is very necessary.
Maine						No	Favours an elastic arrangement for small institution.
Maryland*	4 "	No	No see 7	No	Yes	No	Are now arranging Sabbatical leave on full pay.
Massachusetts	12 "	No	No	Yes	Yes	No	Favours plan similar to Sabbatical leave.
Michigan	4 "	No	No	Yes	Yes	No	This institution will have to provide plan soon.
Minnesota*	4 "	No	Yes ½ pay	No	Yes	No	Favours Sabbatical leave.
Mississippi	12 "		No	Yes	No	No	Very necessary increased compensation should be promised.
Missouri*	4 "		Yes ½ pay		Yes	No	Advanced study indispensible.
Montana*	4 "	No	Yes ½ pay	Yes	Yes	No	Favours present system.
Nebraska	4 "	No	No	Yes	Yes	No	
New Hampshire	4 "	No	No	Yes	Yes	No	No definite opinion, it is partly a financial problem.
New Jersey	4 "	No	No	No	Yes	No	Favours advanced training.
New Mexico	4 "	No	No	No	Yes	No	Favours plan somewhat similar to Sabbatical leave
Nevada	2 "	No	No	No	Yes	No	
New York*	12 "	No	Yes full pay for part, ½ pay for all leave	Yes	Yes	No	Likes present system.
Ohio*	12 "	Yes	No See No. 7	Yes	Yes	No	Institution adopts plan equivalent to Sabbatical leave.
Oklahoma*	4 "	No	Yes ½ pay	Yes	Yes		Favours Sabbatical leave.
Oregon			No				Wishes there was Sabbatical leave.
Pennsylvania*			Yes full pay for ½ year, ½ pay for full year				
Rhode Island							

Tennessee	4	No	No	Yes	No	Regrets that Sabbatical leave has not been provided.
Texas	17	No	No	Yes	Yes	
Utah*	12	Yes	Yes ½ pay	Yes	Yes	Favours Sabbatical leave.
Vermont*			Yes No pay			
Virginia						
Washington	4	No	No	No	No	
W. Virginia				Yes		Favours present plan.
Wisconsin*	16	Yes	No See No. 7	Yes	Yes	No decided opinion.
Wyoming*	4	No	Yes ½ pay	Yes	No	Provides leave equivalent to that given in better class educational institutions. Provides 3rd of year or less of academic credit on full pay if it can be satisfactorily arranged.
U.S.D.A. Washington D.C.*	4	No	No See No. 7	No		
Macdonald College	4	No	No	Yes	No	Favours some arrangement which will secure the return of the graduate student to the institution.
Ontario			See No. 7	Yes		Institution provides leave from 3 to 12 months on full pay. Applicant supplies substitute if this is necessary, but it is usually not necessary.
Manitoba	4	No	No	Yes	Yes	Favours the Sabbatical leave year.
Saskatchewan *	4	Yes	Yes 6 mos. full pay 12 mos. ½ pay	Yes	No	Favours plan which will secure return of applicant for leave after studies are completed.
Alberta	4	Yes	No	No	No	
British Columbia	16	No	No	Yes	No	Believes each case should be decided on its merits.

*Denotes places which have sabbatical leave or its equivalent.

based on the results of wide inquiry, thorough study, and careful deduction.

In the work of the Committee and the preparation of this report the chairman wishes to express his deep appreciation of the cooperation extended by the various members of the committee particularly Dr. Newton, the former Chairman, Mr. Archibald, Director of the Experimental Farms, Dr. Brittain, Prof. Champlin, and Dr. Dickson.

APPENDIX

I am interested to learn what policy is adopted at your institution with regard to members of the staff obtaining leave for graduate study. I have enumerated below a number of points of particular interest but I should be glad to receive any information you might care to offer.

1. What length of holiday period is normally given each year?
2. Is it possible for members of the staff to work the entire year and accumulate several years' holidays in order to secure, with pay, a satisfactory length of period for graduate study?
3. Is Sabbatical leave provided and, if so, what per cent of their salary do members of the staff receive during this period?
4. Is any difference made between the clerical staff and the scientific or instructional staff with regard to holidays and leave of absence?
5. While employed on full-time pay, may members of the staff take courses of instruction in other departments and do such courses count towards a degree? May this be done on part-time pay?
6. Is a rigid policy adopted with regard to extending leave for graduate study or is each case decided individually depending upon circumstances?
7. What is your opinion regarding the advisability and the best methods of providing leave for advanced study?

I shall be very much obliged for any information you might give me on this subect.

(Signed) E. S. HOPKINS,
Dominion Field Husbandman.

State Institutions Where Sabbatical Leave or Its Equivalent is Given.

Arizona	Missouri
California	Montana
Connecticut	New York
South Dakota	Ohio
Illinois	Oklahoma
Indiana	Pennsylvania
Iowa	Utah
Kentucky	Vermont
Maryland	Wisconsin
Minnesota	Wyoming

Report of Committee on Research.*

J. F. SNELL

Macdonald College, P.Q., Chairman.

A more accurate title for this statement would be "Report of the Chairman of the Committee on Research", for the Chairman must confess that with a single exception he has not communicated with any of the members of the Committee since its appointment at last year's convention.

A list of agricultural research projects was prepared by the original Committee on Research (1920-2) and published in *Scientific Agriculture* in September 1922. This list included suggestions for research as well as projects actually under investigation. In the succeeding year an attempt was made to determine definitely which of the problems in this list were being studied and where, and to add to it such projects as had been omitted but were actually under investigation. Considerable progress was made but at the time of the 1923 Convention in Saskatoon the list required further editing. When this was undertaken last fall, it became evident that only fragments of the work of the Dominion Experimental Farms System had found place in our list. Correspondence with Director Archibald brought the information that a list of some 5000 experimental projects of the System was in preparation and the suggestion that until this was complete it would be unwise to publish such fragmentary information and lists as we had. The matter was referred to the Executive Council of the Society, who advised that we defer the publication of our list until after the completion of the official list of Experimental Farms projects. Near the end of March the Director of the Experimental Farms System advised the Chairman that this list was being printed in sections and that there was a prospect, though not a certainty, that the printing would be completed in three months.

Conferring together shortly afterwards, the General Secretary and the Chairman of the Committee decided that the Society's list should be revised with the omission of the projects of the Dominion Experimental Farms, so that the two lists together might represent with a reasonable approximation to completeness the agricultural research in progress in the Dominion of Canada. Unfortunately the Chairman has not yet found time to make this revision. He will undertake to do this during the next month and to send the list to his successor with the recommendation that before publication it be transmitted to the members of the committee for the addition of such information as is necessary to bring it up to date. In its present form it represents the conditions of about a year ago.

The list is tabulated in five columns. The first contains a serial number. The numbering adopted in the 1922 report is retained for such projects as were included in the original list. New projects appearing in the 1923 report are numbered 23/1, 23/2 etc., the intention being to continue this system from year to year. The second column gives the title of the project, this being made as brief as possible for the old projects and in the case of the new ones sufficiently full to give a clear conception of the purpose and scope of the investigations. The third column indicates the institution or institutions in which the topic is being studied. The fourth gives the name of a person connected with the investigation, either the actual investigator or a superior officer to whom inquiries may be addressed. The last column is reserved for requests for the collaboration of other investigators.

In the 1923 list the following classification of research topics is followed, the serial numbering of the projects being separate for each of the main divisions:

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* Presented at the Fourth Annual Convention, C.S.T.A., June 10, 1924.

AGRICULTURAL ENGINEERING & PHYSICS.

AGRONOMY:

I. General.
II. Crops.
  a. General.
  b. Hay and Pasture Crops.
  c. Cereals.
  d. Peas and Beans.
  e. Soiling and Silage Crops.
  f. Roots.
  g. Fibre Crops.
III. Soils and Fertilizers.

ANIMAL HUSBANDRY:

I. Nutrition.
II. Breeding.
III. Markets.
IV. Housing.
V. Survey and Economics.

BACTERIOLOGY.

BOTANY.

I. Bioclimatic Relationships.
II. Ecology.
III. Histology of Vascular Plants.
IV. Plant Pathology, with several subdivisions.
V. Pharmaceutical Botany.
VI. Physiology of Diseases.
VII. Physiology.
VIII. Selection and Breeding.
IX. Soil Relations.
X. Taxonomy and Morphology of Fungi.
XI. Weed Control.

CHEMISTRY:

I. Soils.
II. Fertilizers and Soil Amendments.
III. Plants and Plant Products.
IV. Animals and Animal Products.

DAIRYING.

ENTOMOLOGY.

HORTICULTURE.

POULTRY HUSBANDRY.

RURAL ECONOMICS AND SOCIOLOGY.

VETERINARY SCIENCE.

ZOOLOGY.

MISCELLANEOUS.

The Entomology, Horticulture and Poultry Husbandry lists are fairly long and might be sub-classified to advantage.

In regard to the composition of the Committee on Research it is the opinion of the Chairman that if its work is to continue along the lines followed hitherto, there would be an advantage in having in its membership one representative of each of the Agricultural Colleges, one from the staff of the Dominion Experimental Farms System and one representing other Divisions of the Department of Agriculture. The collection of information about researches in progress in any institution is greatly faciliated by having a member of the committee on the spot.

Quebec Government's Cheese Campaign.

The initiative shown by the Quebec Department of Agriculture in starting a campaign for greater consumption of cheese, is to be highly commended. If it could be supplemented by a similar campaign in other provinces and by a Dominion campaign emanating from Ottawa, a needed stimulus would undoubtedly be given to one of the most important branches of agriculture.

It is astonishing to learn that the per capita consumption of cheese in Canada is only 3.6 pounds per annum. When one considers its cheapness as a food, its nutritive value, and the effect which publicity would have in improving and stabilizing our cheese markets, one must commend highly the initial steps taken by the Department of Agriculture at Quebec.

Report of Committee on Marketing Education.*

A. LEITCH

Ontario Agricultural College, Chairman

This report like that of last year will be chiefly confined to a discussion of resident instruction on the subject by agricultural colleges and will leave for the further work of the committee the study of that great and important section of the subject more closely related to extension endeavor. Last year's report dealt almost entirely with the division of the labor of offering courses in marketing among the various college departments, which by virtue of their technical and practical interest in the commodities or by virtue of their economic interest in the marketing mechanism, have definite responsibilities in the presentation of this subject. This report will deal briefly with the content of marketing courses and only with a discussion of the field to be covered and not particularly with the detailed or itemized subject matter of these courses, which after all will be determined by the facilities of the particular college and the individuality of the instructors.

To promote fuller understanding of marketing in its economic aspects it is necessary to consider the subject in some such light as has been applied to the older technical subjects of production. The teaching of Animal Husbandry, for instance, has not been confined to a presentation of the best practice in feeding and management of live stock. Similarly the teaching of marketing cannot be narrowed to a consideration of selling what one has produced for sale. Just as the study of Animal Husbandry is further widened to a consideration of characteristics of feeds, balanced rations, breed types, pedigrees, so marketing must be broadened to an understanding of the mechanism used in the marketing services of assembling, storing, processing, packaging, financing and ultimate distribution of specific commodities; also of ways and means of improving the present marketing system, by standardization, uniformity of rate of supply and of quality. At this time also when there are such large movements toward development of farmers' cooperative marketing enterprises, marketing education naturally broadens out to a consideration of the science and art of cooperative endeavor.

Even the above broadened field of marketing does not include all that is contained in the up-to-date discussion of the marketing problem. Just as the superstructure for the technique of Animal Husbandry is laid on foundations of the underlying sciences of chemistry, physics and biology, so is the technique of marketing as truly laid on a foundation of the science of economics, both theoretical and applied. The farmer's share in the national income comes to him through the operation of a marketing mechanism that is as intricate and complex as it is gigantic and wide-flung. An intelligent understanding of the functioning of this mechanism must be based on a study of the principles that govern its structure and movement, contracts, credit, competition, monopoly, legal restrictions, property rights, and above all an appreciation of the theory of value and price.

The above general description of the field of marketing raises a question as to how far our system of resident instruction can profitably take an undergraduate student into its subject matter. Let me quote from Dr. H. C. Taylor, Chief of the Bureau of Agricultural Economics and Markets, Washington:

"How far the student should enter this field depends upon the end he has in view. If he contemplates entering the actual work of

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* Presented at the Fourth Annual Convention, C.S.T.A., June 10, 1924.

marketing a specific product and does not expect to try to solve the deeper problems of marketing, the courses may be limited to the geography of production, the centers of consumption, the methods of handling the specific product, the marketing institutions involved, whether boards of trade, commission systems or cooperative organizations, the methods of financing the harvesting, storage or movement of the product and the business practices involved.

"If, however, the practical man cares to become aggressive in instituting improved methods and practices in other countries than his own, he should master the theory of value in its various applications and become a student of prices, which involve equipment in the field of statistical method. This soon leads far beyond the field of elementary studies in economics and marketing. As one views the subject of marketing from the broad public standpoint, and as the general welfare rather than individual gain becomes the goal, nothing short of a thorough training in the whole field of economics becomes essential to the most efficient prosecution of the work. More concretely stated, the student should take elementary courses in economic geography, economic history, accounting and statistics as background and method courses, followed by a course in economic theory so taught as to give the student a clear view of economic forces operating under a great variety of conditions, static and dynamic.*

"The course in economic theory should be followed by a course in economic institutions and economic legislation as they provide for and set metes and bounds to economic activities and as they modify the distribution of wealth.

"With these basic courses in mind, the student may approach studies in marketing methods, in cooperative marketing, and other methods of improving the marketing system, equipped to view analytically and critically each proposal or practice with a view to taking from it that which is helpful and discarding that which can be improved upon, and working out new methods which will better attain the goals of fairness and efficiency."

How the above large order of subject matter is to be included in our already overcrowded college curricula particularly in our general courses in agriculture, is a problem that cannot be solved except as experience teaches.

The first step that suggests itself would be to make our present courses in Political Economy, or Economic Theory, basic courses to marketing rather than cultural and general as they are now inclined to be. This may mean the discard of some of our old views and methods of teaching this subject which is entirely in line with recent advances of the economist from theory to application. An appreciation of the theory of value is absolutely essential to an understanding of the functioning of the machinery of exchange or transfer of goods, especially if one is to choose what is good and what is bad among the many schemes economic and legislative that are at this time being suggested for the improvement of the farmers' market returns. Only from an appreciation of the organization of the factors of production and the law of diminishing returns can there come a correct understanding of the competitive power of Canadian producers in the struggle for export markets. An understanding of the fundamentals of money and credit is obviously essential to anyone who is to assist in the development of better marketing machinery. Space does not permit of further enumeration of the large number of phases of marketing development that are based on economic law and principle. Enough has probably been here presented to point to the necessity of a foundation of economics for the technical structure of marketing courses.

An elaboration of the subject matter of the technical courses in marketing that would be useful to this body requires not only an exhaustive study of subject matter itself, but, in addition, a thorough examination of the facilities, calendar, personal and physical, of the various colleges, for effecting marketing courses. Hence the confinement of this report to foundations.

*Note: Dr. Taylor later recommends as a saving in time that courses in Economic History and Economic Geography be compressed into one brief elementary course along with such sections of economic theory as are peculiarly agricultural in their application.

A Standard Method of Plant Survey for Agricultural Forecast

V. W. JACKSON

Professor of Biology, Manitoba Agricultural College.

As plants are the expression of all the factors that make for their success, it follows that as many of these life relations as can be pre-determined, should be made available for the worker.

Hopkin's Bioclimatic Law makes a broad generalization of the factors common to all localities and conditions—latitude, longitude and altitude: that for each degree of latitude, 5° of longitude or 400 feet of altitude there

NORMAL CLIMATIC EXTREMES AND MEANS FOR FROST-FREE SEASON IN MANITOBA.

	M.A.C., Winnipeg Alt. 760	Buffalo-grass (*Boutelova oligostachya*)	Black Poplar (*Populus balsamifera*)	Scrub Oak (*Quercus macrocarpa*)
Frost-free season (ffs)	62*(100)*138*	53-305	25-172	85-261
Hot days (ffs) over 68° daily mean	37———46	0-211	0-88	0-173
Cold days below 32° daily mean	137———163	0-158	92-137	0-158
Coldest 14 days, daily mean	—20.1°F.		-21.5	-21
Coldest 4 weeks, daily mean (Jan.)	— 3.5°F.	0-51	0-24	-5.5
Hottest 6 weeks, daily mean	67.2°F.	64-79	64-72	65-79
Absolute extremes	—48° — 96	59	59	59
Remainder summation over 39°F.	2584	3-10T	10-11.5T	2-8T
Exponential summation, 2 (t-40÷18)	175	3-12H	2.6-2.5H	3-9H
Physiological summation, 20 at 60.° etc.	3185	3.7-21T	2.1-7.5T	2-17T
Rainfall per annum, inches	21.11*	10-40	20-50	20-60
Rainfall Apr., May, June, July	10.04			
Rainfall Apr., May, June, July—daily mean	.1	.03-.14	.04-1.3	.07-.135
Rainy days over .01 inches (ffs)	27-37	2-161	0 -135	21-159
Percentage of dry days (ffs)	68%	17-99	17-100	17-81
Evaporation (ffs) inches	18.05			
Daily mean (ffs) 100 days	.18	..1-.3	.08-.22	.08-.18
Moisture ratios				
Normal P/E (ffs) .1÷.18.	.56	.13-1.16	.2-1.5	.43-1.63
Moisture-Temperature Index				
Normal P/E x T. ffs (remainder)	1480	1-6T	1-4T	1.3-6T
Normal P/E x T. " (exponential)	96	98-1 T	1-4.4H	135-668
Normal P/E x T. " (physiological)	1778	1-20T	1-6.5T	1.9-10.7
Wind-mean hourly vel. (ffs)	5.5-(7.75)-10			
Sunshine hours (ffs)	(878)*-1169 in 1923			

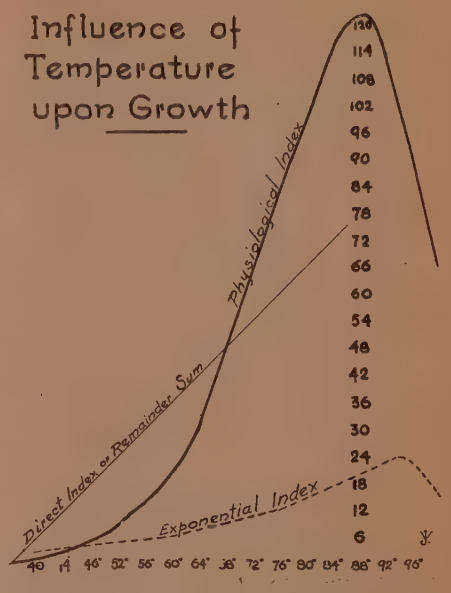
NOTE:—Data starred * are the average for 46 years. The rest are for 4 years (1920-1924) at M.A.C. Physics Department. T means thousands, H means hundreds, ffs means frost free season, which for Winnipeg is 100 days (average for 46 years).

is a difference of four days in the maturity of crops. For altitude and longitude this seems quite correct for the prairie provinces where each step on the prairies is about 400 feet up as we go westward but as we go northward we find the vegetation at lat. 54° about the same as at 49° and corn will ripen within a ten day fluctuation over 350 miles of latitude. This is due, of course, to the summer isotherm of 60 nearly paralleling longitude 100, and the rapidly lengthening of the day in high latitudes.

Temperature, moisture and evaporation are far more important growth factors than these and Livingston and Shreve have worked out a standard for growth factors that should serve as preliminary data for any district. Applied to the Red River basin it shows a transition zone with limiting factors for some eastern, western and southern plants, and crops; Buffalo grass reaches its eastern limit on the Altona ridge and at Stony Mountain both ten miles west of the Red river. Our only oak has been chosen as a southern invader which reaches its northern limit in latitude 52.5°, and Black Poplar or Balm of Gilead because it reaches its western limit within our boundary. Corn can be successfully grown in lat. 54.

The importance of temperature as a growth factor is well shown in Lehenbauer's experiment with corn at different temperatures, here given in graph, showing optimum at 89°F. when the growth was 122 times that of the unit growth for one degree at 40°F. This rapidly increasing rate of growth up to 88°F. has been proven to be a much more accurate index than the exponential index, based on Van't Hoff's law for reactions,—of double the reaction rate for each 10°C. or 18°F. increase. You will notice that the minimum exponential summation and moisture-temperature index of all three plants cited is above that of Winnipeg, and yet these plants are well within our range. The physiological index seems a much closer approximation to growth conditions.

Merriam's temperature integrations of thirty years ago stressed the importance of temperature summations. He suggested that "the physiological constant of a species must be the total quantity of heat or sum of positive temperatures required by that species to complete its cycle of development and reproduction"....."and plants and animals are restricted in northern distribution by the total quantity of heat during the season of growth and reproduction."



The total quantity of heat or sum of positive temperatures is here interpreted as degrees of daily mean temperature above 39°F. where growth begins, and is known as remainder summation or direct index, graphically represented by an incline of 45° upwards. The exponential index is the sum of the daily indices obtained by doubling the growth for every 18°F. or part thereof, above 39°, thus at 58° it is double and at 76°F it is four times what it is at 40°, but this is far too low an estimate for the influence of temerature on growth, and the physiological index based on actual growth at different temperatures is displacing the exponential index as a growth indicator. Owing to the rapid increase of growth during summer heat the physiological index is greater than the direct index for all daily means above 52°, and increasingly so for higher temperature up to 86°. (See graph).

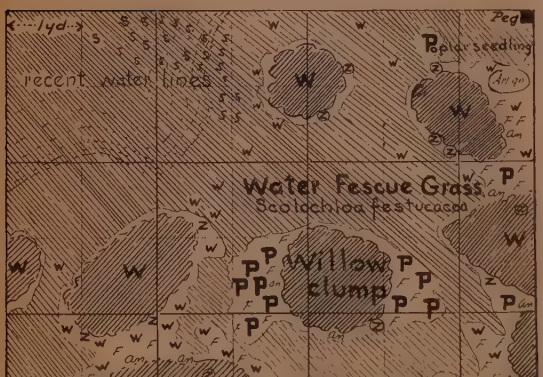
The second great factor, moisture, is limited by the third, evaporation, and the difference between these is the balance of moisture to be spent in growth. Our average precipitation (P) for April, May, June, and July is 10 in-

PLANT SURVEY—Biology Department Manitoba Agricultural College

Station No. 101 Arnaud Location S.35 T.3. R3 Date May 23rd '24
Formation Willow grassland Origin Alluvial marsh Age Initial poplar
Drainage none wet ~~Acid or~~ Alkaline Exposure open prairie
Surface soil black clay Moisture standing water Temp. cold
Subsoil gumbo Moisture at 1 ft. wet Temp. cold
Dominant Vegetation Willow clumps and grass
Subdominant Vegetation, spring shrubs summer grass fall Compositae
Herbaceous cover grass, Strawberry, Anemone, Zizia 50%
Ruderals or Invaders Sowthistle, gumweed, dandelion
Reproduction Seedling poplars - 1600 per acre
Indicators Initial poplar stage - dry in Summer
Notes Ant hill in S.E. Corner → Prairie Sage ← Scolochloa → water
Area should be protected and undisturbed C.P.R.
Name V. W. J. Map on other side May 24th

Quadrat ~~1 sq. M~~ .01 ac.
Transect or Count
1924-1930

Salix	50%
Scolochloa	40%
Pop. tr.	16. Seedlings
Rosa	12.
Fragaria	4%
Anemone	2%
Zizia. co.	1%
Art. gnap.	2%
Sonchus	1%



ches and the evaporation (E) is 18 inches. The ratio is 10:18 or .56, and the moisture-temperature ratio, .56 of physiological summation of temperatures, is perhaps the best growth index so far formulated.

We can now go afield with definite data on the factors that make for growth in any vegetation as we find it. The other factors will be purely local and best summarized in a detailed quadrat or small area survey. The best standard area for spring and fall and for mixed vegetation such as scrub or shrub land woodland or transitional zone is 100th of an acre, which is seven paces square. One should have a big, flexible, white cord 28 yards long with knots tied in it every yard. Starting in the north-east corner of a representative area, drive in a stake with the number of the station on it. From this lay the string 7 yards west, 7 south, 7 east and 7 north; it will test the square. One should have an extra, loose white cord for placing across the quadrat, surveying a yard strip at a time to keep an accurate count of trees and herbaceous cover.

The only other outfit necessary is an auger or dibble for soil sampling, tight tin cans for samples, litmus papers for testing alkalinity or acidity on the spot, thermometers for taking temperatures and humidity, a hatchet for making and driving permanent stakes and a standard record blank for systematic and future recording. A stiff card 4x6, with data on one side and map on the other, such as used at the M.A.C. is very convenient in the field, and for filing. Above is a sample from a survey recently made of a level undrained area east of the Red River (T. 3 R. 3), wet in spring, pasture land in summer

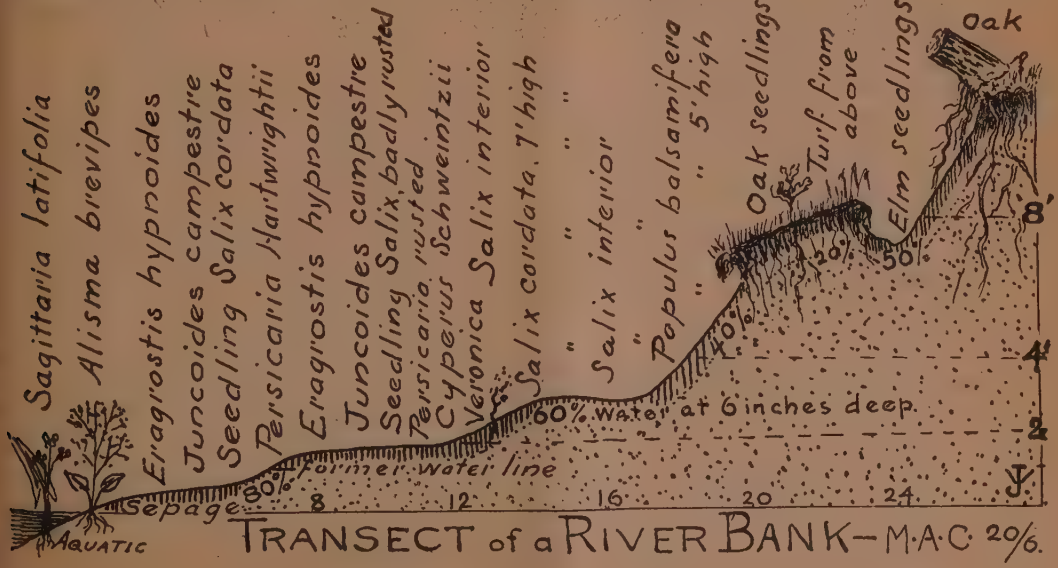
with small shrubby willows over 50% of the area.

What is the natural future of this land? The seedling poplars, where there are no larger poplars in sight, indicate that poplars are coming in and the succession will be willow - poplar - Viburnum - Prunus - hazel - saskatoon (*Amelanchier*), by which time this dense mesophytic vegetation will so have lowered the water table that oaks will come in and a subclimax stage be reached, which with surrounding settlement and grazing usually gives way to Kentucky Blue-grass. At present some of this wet area of old hay marshes is utilized for timothy, but this is a passing phase, as the soil will soon be too dry for timothy. The ant hill in the S. E. corner of the quadrat indicates that the soil gets quite dry in the summer, as does also Prairie Sage (*Artemesia gnaphalodes*). The sub dominant water grass (*Scolochloa festucacca*) indicates that it has quite recently been wet or under water most of the summer. The invading willows have dried it up. Incoming poplars and shrubs will finish the job and in a very few years. Ten-year-old poplars are an inch or more in diameter, 8,000 to the acre, and their extensive surface roots soon dry the top layer and prepare the way for hazel and all the rest that follow.

Where there are sudden changes in the vegetation, due to elevation or water supply (chresard) it is better to make a line survey or transect across these transitional zones, by extending the cord from the lower or hydrophytic zone to the higher vegetation at right angles to the zonation and note and list the representative plants along the cord at correct distance and elevation.

The plant zonation around a pond or along a river shows how definitely each species is linked to a certain water supply or drainage. The aquatic plants quit at the water line; the hydrophytes occupy the seepage zone; and rushes and the sedges hold alluvium and build the seed bed for trees. The poplars with shallow surface roots can best thrive on the still high water table and lower it until the deep-rooted oak can get the drainage it requires.

Around alkaline sloughs one finds a zonation with little or no rise in the surface. Alkalinity is here the limiting factor. The slough may be 3% to 20% alkaline with no plant growth until the salt content is less than 2.6%. Then there will be a zone of Red Salthorn (*Salicornia rubra*) until the alkalinity is reduced below one percent, when alkali-grass (*Distichlis*) begins to get a foot hold and Dondia and Atriplex thrive at 0.8-0.5%. When we reach a zone where the alkalinity is less than one-half percent, Beardgrass (*Andropogon*) Dropseed (*Sporobolus*) and Wild Barley (*Hordeum*) encroach upon the area, and Artemesia where the alkalinity is less than one-half of one percent. These



plants (halophytes) are, therefore, very definite indicators of the percent of alkali present in a zone.

On the open prairie or short-grass plains the square meter quadrat affords sufficient detail to approximate the grassland formation round about. Below is a typical quadrat survey in the S. W. corner of Manitoba (T1. R29.)

tions or forecasting the future of virgin lan Knot grass, Tansy Mustard, Artemesia ar Gumweed are the earmarks of over-grazing too-firmly packed soil. Rotation and cultiv tion are the worst enemies of these invade

Bunch-grass areas suggest the lack of su ficient soil moisture to maintain a comple covering of the soil. Dry farming is nece sary on the short-grass plains or bunch gra

PLANT SURVEY—Biology Department Manitoba Agricultural College

Quadrat (1 sq. M) ~~.01 sc~~

~~Transect or~~ Count

Station No. 17 Sturch's Ranch Location T1. R29. Copley Date June 27th 1921

Formation Short grass plains Origin Lake Souris basin Age pastured 20 yrs.

Drainage S. Antler ¼ mi ~~Acid or~~ Alkaline Exposure open prairie

Surface soil Sandy grit Moisture Drifts where bare Temp 106° at 3 pm

Subsoil Sandy silt Moisture at 1 ft. dry (1.5%) Temp 69°–75°

Dominant Vegetation Bouteloua oligo. and Koeleria cristata

Subdominant Vegetation, spring Carex summer Compasite fall none

Herbaceous cover about ~~Phlox~~ Chrysopsis, Stipa 50% ½ bare

~~Ruderals or Invaders~~ ~~Weeds~~ Heuchera (Alum root) & Selaginella densa

Reproduction by propagules. All perennials

Indicators Heuchera & Selaginella indicate once moister

Notes 20 acres per cow. Treeless & shrubless except along the Antler

Area ~~should be~~ protected and undisturbed.

* Blank cards can be obtained from Biology Dept M.A.C.

Buffalo grass	12%
Koeleria —	5%
Stipa sp —	3%
Andropogon	2%
Selaginella	8%
Carex steno	6%
Chrysopsis	5%
Hood's Phlox	9 tufts
Potentilla sp	7 "
Eriophorum	15 "
Heuchera	3 "
Solidago	18 "
Artemesia sp	22 "
Androsacea	27 "
Total	22 species
	318 plants
	50% bare

Even on this semi-arid land with half the surface bare there are 318 plants of 22 species on the square meter. The 22 tufts of grey Artemesia (Prairie Sage) indicate overgrazing, but the close edaphic Buffalo-grass has withstood it all despite the fact that it is the sweetest of the grasses and the most grazed. *Carex stenophylla* affords early picking until the Buffalo grass revives. Selaginella (8%) and Heuchera indicate ample moisture in the early spring and are relics of a previous and perhaps quite recent mesophytic condition indicating a rather rapid change in the conditions and flora of this area. Eriophorum, Hood's Phlox, and Androsoceae are new comers indicating increasing drought conditions, and poor soil.

Plant Indicators.

These plant indicators suggest many others that are of value in determining soil condi-

hills. Stipa or Spear-grass is the usual i dicator.

Alkali-grass (*Distichlis spicata*), Purpl beard grass (*Andropogon furcatus* and *sc parium*), Wild Barley (*Hordeum jubatum* and Artemesia indicate an alkalinity unfavo able to crops and Red Salthorn and Atripl indicate a salt content where nothing el will grow.

Russian Thistle and Wild Sunflower (*He ianthus petiolaris*) indicate drought cond tion whereas Horseweed (*Erigeron canade sis*), Lambs Quarters, Redroot, False Ra weed, Giant Ragweed, and Russian Pigwe are ruderals or waste land weeds indicati of rich, but neglected land. Well-borers lo upon Tall Cord-grass (*Spartina*) as indica ing well-water below. Its long wate searching roots, like those of willow, m often find a water pocket where other roo would fail. Its vigor and luxuriance sugge that it does.

The Oak (*Quercus macrocarpa*) indicates drainage. Its ability to withstand fire and to come up again from the old root is often evidence of a burnt-over area, as is also a uniform or solid stand of young poplar, and several fireweeds as Epilobium and Erigeron. The willow always precedes the poplar because more tolerant of water, and any willow and dogwood in a poplar bluff are leftovers (relicts) from the previous, wetter stage, and indicative of low spots and standing water for some time during the spring. Even the poplars segregate with difference in water supply,—the Black Poplar (*Populus balsamifera*) taking to the lower and more shady parts.

Where the willows and dogwoods have not prepared the way for the poplars, the ash takes possession of the wet open spaces, and as cattle, grass-burns, and grass invasion tend to kill off the shrubs and the shallow-rooted poplars, the ash is gaining ground and in many parts will soon outnumber the poplar. Here again settlement has altered the succession.

The sequence and significance of plant succession was given in the first discussion. Every plant formation is a stage in the development of a vegetation. We cannot disturb or jump a succession without serious consequences. If we drain a grass marsh or shrub willow area by government ditch or other rapid means, sow thistle and other ruderal weeds will take possession, as they can adapt themselves to the sudden change more quickly than our pampered crops.

On the higher, drier, short-grass plains a different stage but a similar law of nature prevails. Wherever short-grass land is broken and then abandoned or neglected, it is first covered by a growth of weeds (Wormseed mustard, Tansy mustard, Russian thistle, Tumbling Redroot, etc.), after which the type of vegetation that immediately preceded the short grass regains possession. In other words, the temporary annuals will be crowded out by a slow invasion of the indigenous perennials, which by thousands of years of struggle have developed roots that will reach to the scanty water 10 or 15 feet below or that can gather enough of the surface precipitation to thrive as does Buffalo-grass.

When the pioneers turned down the virgin turf of the prairies they did not fully realize that they were turning down perennials of a thousand years' adaptation to these conditions, with roots reaching ten to twenty feet below, to be replaced by shallow or scanty-rooted annuals. For a time the crop flourishes on the accumulated wealth of root humus; now soil-binding Brome-grass and deep-rooted clovers and alfalfa will be necessary to establish virgin fertility again. Of the 22 species found on a square meter (see survey card No. 17) the tiny Androsaceae was the only annual, and this is in seed in May. All the rest are perennials, and, therefore, indicators of how to return to virgin conditions.

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Results of Hog Grading and Grading of Wiltshire Sides

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Considerable interest and inquiry has been displayed by hog producers and others, during the past two seasons, in connection with hog grading, as practiced on our live stock market. For the purpose of obtaining definite information on this subject, the Animal Husbandry Department of the M.A.C., in co-operation with the Federal Live Stock Branch, conducted an investigation in the grading of carcasses and Wiltshire sides from hogs previously graded, to determine the relationship that exists between the grades of live hogs and the kind of Wiltshire sides produced therefrom. Incidently this investigation was also coupled up with a feeding experiment conducted during 1923, to determine the effect of feeds upon the type of pig.

The pigs were first graded by a regular grader, and then weighed before slaughtering. Each pig was tagged for purposes of identification and its weight and grade were carefully tabulated. In order to facilitate the carcass grading, the carcasses from the pigs slaughtered early in the fall were put into cold storage. To correct the loss while in storage seven percent was added to the weight of all Wiltshire sides from carcasses that were in storage over thirty days.

A Wiltshire side is half a hog carcass with the head and feet cut off, and the back bone, pelvic bone and breast bone removed. It is given a mild cure and smoked.

Requirements of a Wiltshire Side:

A Wiltshire side should be from 50 to 6 pounds in weight, (slightly lighter and heav ier sides may be used for certain markets and have a minimum length of 28 inches from the point of the aitch or hip bone t the forward side of the first rib. The should er and ham should be equal in weight. Th belly should be the same thickness as the bac fat and the covering of fat on the back shoul be equal in depth from neck to tail.

Grades of Wiltshire Sides:

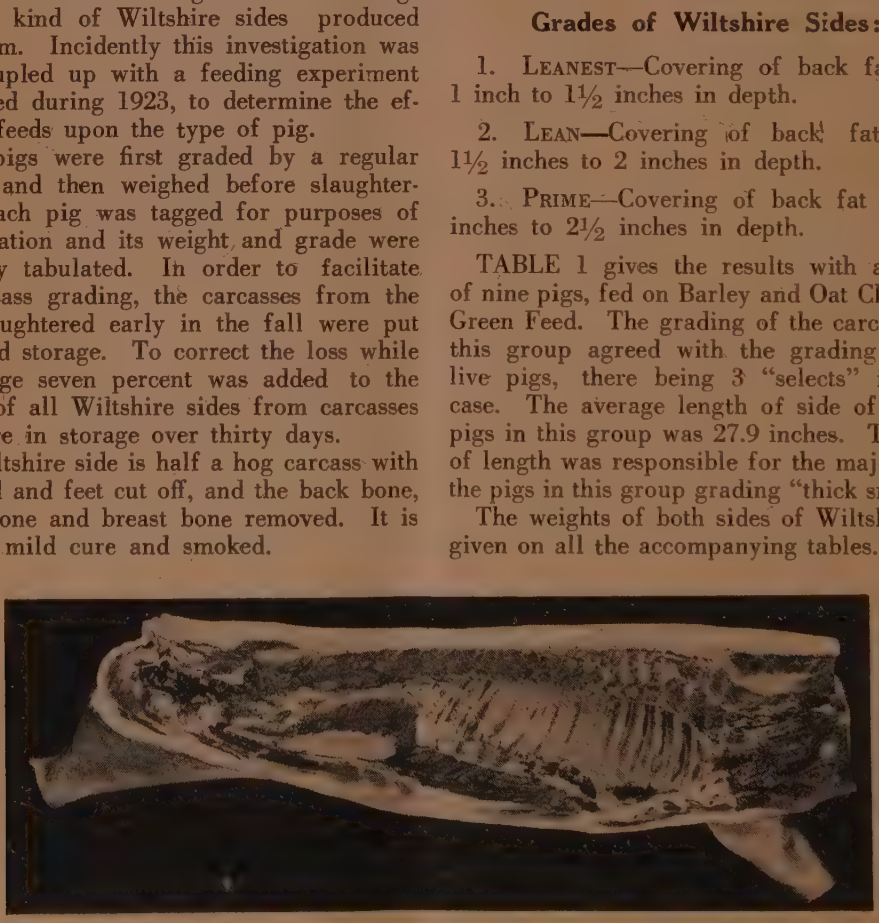
1. LEANEST—Covering of back fat fro 1 inch to 1½ inches in depth.

2. LEAN—Covering of back fat fro 1½ inches to 2 inches in depth.

3. PRIME—Covering of back fat from inches to 2½ inches in depth.

TABLE 1 gives the results with a grou of nine pigs, fed on Barley and Oat Chop an Green Feed. The grading of the carcasses i this group agreed with the grading of th live pigs, there being 3 "selects" in eac case. The average length of side of all th pigs in this group was 27.9 inches. The lac of length was responsible for the majority o the pigs in this group grading "thick smooth"

The weights of both sides of Wiltshire ar given on all the accompanying tables.



A WILTSHIRE SIDE OF THE PROPER CONFORMATION

TABLE NO. 1

Group A. (Barley, Oats and Green Feed)

Weight alive	Grade of Pig	Weight of Wiltshire	Grade of Wiltshire	Length of side	Remarks
221	Select	119.1	Leanest	30″	Very good side
191	Thick Smooth	107.4	0	27½″	Side short and shoulder heavy.
180	Select	95	Leanest	29¼″	
188	Thick Smooth	104.2	0	26½″	Side too short
184	Select	103.2	Lean	28″	
186	Thick Smooth	108.5	0	28″	Side not well balanced. Would make 2nd grade Wiltshire.
154	Light	86	0	28½″	Too light
182	Thick Smooth	101.6	0	27	Too short
159	Light	91	0	27	Short and light

Number of pigs graded "select" by grader	3	
Number of carcasses graded "Wiltshire" by grader	3	
Average length of side of "select" pigs		29.08 inches
" " " other "		27.4 "
" " " group		27.9 "

TABLE 2. The nine pigs included in Group B, were fed similarly to Group A except that in the case of Group B, the Barley and Oat Chop was sifted during the first month of the test. The pigs were graded and weighed, also carcasses were graded and converted into Wiltshire sides, exactly in the same way as Group A.

It will be observed that four of the pigs in this group produced Wiltshire sides, while only two pigs graded "select". It will also be noted that the pigs weighing around 170 pounds alive made Wiltshires slightly under the weights desired. The average length of the carcasses in the group was a little longer than Group A, although the difference was slight.

TABLE NO. 2

Group B. (Barley, Oats and Green Feed)

Weight alive	Grade of Pig	Weight of Wiltshire	Grade of Wiltshire	Length of side	Remarks
190	Select	105.8	Leanest	29″	
194	Thick Smooth	116.5	0	28″	Unbalanced
181	" "	107.4	0	27″	Short
186	Select	107.4	Leanest	28″	
190	Thick Smooth	106.3	0	28″	Second Wiltshire grade -- lacks balance
183	" "	101	0	28″	Unbalanced - would make second grade
171	" "	92	Lean	29″	
174	" "	90	Leanest	29¼″	On the light side
127	Light		Light	26¼″	Too light

Number of pigs graded "select"	2
Number of carcasses graded Wiltshire	4
Average length of "select" pigs	28.65
" " others	27.31
" " group	28.05

TABLE 3. The eight pigs in this lot received shorts in addition to Barley and Oats. The Chop was sifted for the first month similar to Group B. The number of pigs that graded "select" and the number of carcasses suitable for Wiltshires were the same, 4 in each case. However, one "select" pig was undesirable for Wiltshire on account of finish and softness of fat, while a "thick smooth" pig made a desirable Wiltshire.

The length of the carcasses in this group was considerably longer than Groups A. and B. Lack of finish and firmness of fleshing prevented two carcasses in this group grading as Wiltshire.

TABLE NO. 3.

Group C. (Barley, Oats, Shorts and Green Feed)

Weight alive	Grade of Pig	Weight of Wiltshire	Grade of Wiltshire	Length of side	Remarks
194	Thick Smooth	109	0	27″	Short
205	Select	112.7	Leanest	30	Extra good
184	"	101.5	"	29½	
196	Thick Smooth	106.3	0	29	Bacon soft, but of "select" conformation.
190	Thick Smooth	111.7	0	26½	Very Short
185	Select	98.4	0	29	Underfinished and soft.
207	"	112.2	Leanest	29	
206	Thick Smooth	112.7	"	29	
	Number of pigs graded "select" by grader			4	
	" " carcasses graded Wiltshire by grader			4	
	Average length of "select" pigs			29.3	
	" " others			27.8	
	" " group			28.6	

TABLE 4 gives the results of Group D, consisting of nine pigs that were fed Barley, Oats and 10% Tankage. This group developed into a remarkable lot of market pigs, having length, smoothness and evenness of covering; seven out of the nine pigs graded "select" alive and eight carcasses were suitable for making Wiltshire. The average length of the sides was nearly two inches longer than the carcasses of Group A. Although the groups at the beginning of the test were as uniform as it was possible to select them. The results of this test would indicate that the addition of Tankage stimulated growth and had a marked affect on the type of pig produced.

TABLE NO. 4.

Group D. (Barley, Oats, Tankage and Green Feed)

Weight alive	Grade of Pig	Weight of Wiltshire	Grade of Wiltshire	Length of side	Remarks
194	Select	111.1	Leanest	28¾	
201	"	114	"	30¼	Skin slightly wrinkled.
223	"	122.3	"	29	Lean meat dark
203	Thick Smooth	118	0	28	Heavy shoulders
191	Select	114	Lean	31	
225	"	126.5	"	30	
215	"	121.2	Leanest	29½	
196	Thick Smooth	112	"	30	
188	Select	105	Lean	30¼	
	Number of pigs graded "select" by grader			7	
	" " carcasses graded Wiltshire by grader			8	
	Average length of "select" pigs			29.9	
	" " " others			28.0	
	" " " all			29.66	

TABLE 5, Group E. received skim milk in addition to Oats and Barley. This group produced 4 "select" pigs, also 4 carcasses suitable for Wiltshire. One "select" pig made a carcass unsuitable for Wiltshire, while a pig grading "thick smooth" was satisfactory. A liberal allowance of skim milk was given this lot during the first part of the test, resulting in the pigs making relatively large gains and putting on considerable flesh. It is posible that had the amount of skim milk been somewhat reduced during the early period of growth and the pigs not allowed to put on so much condition that a larger number of them, when ready for market, would have graded "select". Altogether this group produced shorter sides than Group D, had more condition and were ready for market two weeks earlier than the other groups. The average age of the pigs in this lot at the time of slaughtering was 6 months and 6 days and the average weight 200 pounds..

The results would indicate that forced feeding during the early stages of growth prevents the development of length of side and tends to produce market pigs of the "thick smooth" class.

TABLE NO. 5.

Group E—Barley, Oats, Skimmilk and Green Feed)

Weight alive	Grade of Pig	Weight of Wiltshire	Grade of Wiltshire	Length of side	Remarks
189	Thick Smooth	102.1	0	27″	Too short
197	Select	113.2	Lean	28½	
202	Thick Smooth	115.9	Leanest	30	
216	Select	124.4	0	30	Unbalanced - would make 2nd grade Wiltshire.
224	"	132.9	Lean	30½	
191	"	110.1	Leanest	29	
202	Thick Smooth		0	27	Too short
185	" "	110.6	0	27	" "
194	" "	112.7	0	27½	Extra good but short
	Number of pigs graded "select"			4	
	" " carcasses graded Wiltshire			4	
	Average length of "select" pigs			29.5	
	" " " others			27.7	
	" " " all			28.5	

SUMMARY OF RESULTS OF GROUPS A. B. C. D. and E.

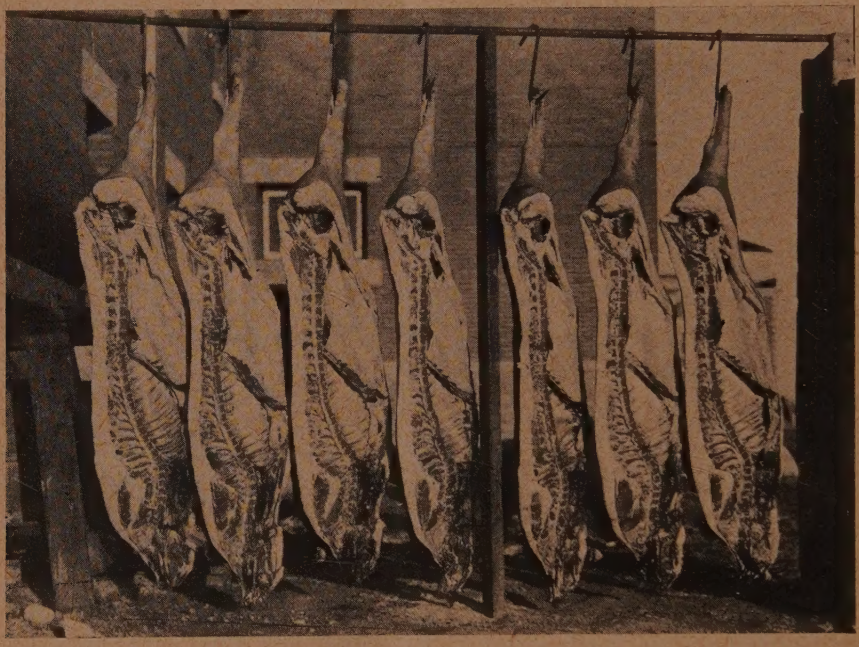
Live Grading —	20 selects	21 Thick Smooths	3 Lights
Carcass " —	23 Wiltshires	18 undersirable for Wiltshires	3 Lights

2 "select" pigs were undersirable for Wiltshires while
5 "thick smooth" were suitable for Wiltshires.

RELATIONSHIP OF LIVE WEIGHT OF PIGS TO WEIGHT OF WILTSHIRE SIDES.

Range of weight	No. of Pigs	Average Weight	Wt. of two sides of Wiltshire	Wt. of one side of Wiltshire
170 — 179	2	172½	91½	45¾
180 — 189	13	184	103½	51¾
190 — 199	13	193	110½	55¼
200 — 209	7	203	113	56½
210 — 219	6	216	125	62½
220 — 229	4	223	125	62½
230 — 239	2	231½	138½	69¼

TABLE 6 gives the results of grading 7 carcasses produced from one litter of pigs, slaughtered when 6 months and 14 days old. The pigs had remarkable length and smoothness and were typical bacon hogs. This lot was fed on farm grains and skim milk along with some green feed. The pigs in this were a little over done, carrying too mu fat along the back and should have be slaughtered about one week to ten days ea ier.



A uniform lot of sides produced from Group F. Two of these carcasses carried too much fat over the shoulder to make suitable Wiltshires.

TABLE NO. 6.

Group F.—(7 pigs from one litter, 6 months old when slaughtered)

Weight alive	Grade of Pig	Weight of Wiltshire	Grade of Wiltshire	Length of side	Remarks
231	Heavy	138	0	30″	Fat, too thick ove shoulder.
216	Select	126	Lean	29	Excellent side
232	Heavy	139	0	29½	Fat too thick on shoulder.
208	Select	118	Leanest	29½	Extra good
217	"	130	Lean	30	Trifle thick
216	"	126	"	30	" "
216	"	123	Prime	29	" "
Average live weight of Group E.				219.4 lbs.	
" dressed weight				164.7	
" weight of Wiltshire side				64.2	
" length of side				29½″	

Foot and Mouth Disease.*

Outbreaks of Foot and Mouth Disease have never occurred in Canada. This disease is probably the most infectious malady of animals of which we have knowledge and causes tremendous losses to the agricultural interests of any country it invades. It spreads very rapidly and extensively, and entails the entire loss of export trade in live animals and the interruption of domestic commerce. Unlike most other infectious diseases Foot and Mouth Disease may attack the same animals repeatedly, and they are, therefore, a dangerous source of infection.

There is no permanent cure for Foot and Mouth Disease; the majority of affected animals recover from an attack in ten to fourteen days without treatment. The greatest difficulty is the eradication of the infection and this can only be accomplished by the slaughter of all affected and exposed animals, the proper destruction of their carcasses and the thorough disinfection of all contact matter. If not controlled by these radical measures the disease spreads very rapidly throughout the whole country, affecting practically all susceptible animals with enormous economic losses.

The disease commences with a high fever, followed by inflammation of the membranes of the tongue and those lining the mouth, also of the sensitive structures of the hoof. This is quickly followed by the formation of blisters on these membranes, carying in size from that of a pea to that of a hazel nut. These blisters also appear on the udders and along the top of the hoof, also in the cleft dividing the hoof. They may be present in all these membranes in the same animal, or may appear only in the mouth, or may be limited to the hoofs.

Cow showing typical foaming at mouth in early stage of Foot and Mouth Disease.

The symptoms are very characteristic. The irritation of the membranes in the mouth results in loss of appetite, and dribbling of saliva from the mouth, which, owing to constant movement of the lips and tongue, becomes frothy, and adheres to the corners of the mouth and muzzle. The animals often make a peculiar smacking sound with their mouths.

Extreme lameness occurs when the lesions appear on the cleft and on the top of the hoof.

The fever and the difficulty in eating causes a rapid and extreme loss in flesh, and a serious lessening or cessation of the milk secretion.

The udders often become inflamed and ruined by abscess formation, and a large number of cattle so affected are rendered permanently valueless for milk production.

The inflammation of the feet frequently results in the shedding of the hoofs, causing permanent injury.

While this disease is essentially a disease of cattle, sheep, goats and swine, all ruminating animals are susceptible. Horses, dogs, cats, and even poultry, have been victims of the infection, the last three classes being dangerous as carriers of infection. Man may also become infected, and children frequently suffer through drinking raw milk from infected cattle.

As all the natural discharges of affected animals are highly infective, and as some of them, particularly the saliva, are largely increased during the attack, the disease is readily conveyed by these media. It is frequently conveyed from place to place by human

*Submitted for publication by the Dominion Department of Agriculture.

agencies, such as attendants, owners and interested neighbours, as also by dogs and all small animals.

Although the fatalities are quite low serious losses result from the diminution or cessation of the milk secretion and consequent interference with the business of the dairy, as well as through the extreme loss of flesh in animals. Dairy farmers are put entirely out of business for indefinite periods. Quarantine restrictions seriously interfere with the movement of live stock, their parts and products, also of hay, straw and other fodders, in addition to other farm produce. Stockyard operations and the business of slaughtering centres are seriously interfered with. Marketing, transportation, feeding and slaughtering operations are deranged and interfered with. Losses of this character may reach enormous proportions. The foreign markets are promptly closed and the export trade of an infected country is lost for long periods.

The British authorities have been endeavouring at a cost of millions of pounds to eradicate the infection of this disease in that country for over two years, and those of the United States are similiarly engaged in the State of California, where it was recently introduced from foreign countries through the Port of San Francisco.

The Canadian Federal Department of Agriculture, with a view to protecting our live stock interests, are enforcing the most stringent regulations which cover the species of animals and commodities that are likely to carry the infection of the disease.

If live stock owners should have reason to suspect the existence of this disease in Canada, it is of the utmost importance that they notify the nearest Veterinary Inspector and telegraph collect to the Veterinary Director General at Ottawa. In the meantime they should tie up their dogs and not permit anything to leave their premises. Prompt control measures and the willing and intelligent cooperation of the stockmen are essential to prevent disastrous results if the infection of this disease gains entrance to Canada. Everyone should remember, however, that prevention is better than control.

Shooting cattle in the trenches preparatory to burial because of having been in contact or on same premises with cattle suffering from Foot and Mouth Disease.